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[ORIGINAL COMMUNICATION.]

REMARKS ON THE DIGEST OF CRITICISMS ON THE U. S. PHARMACOPŒIA.

BY PROF. CHAS. T. P. FENNEL, OF CINCINNATI, OHIO.

[Continued from page 3.]

THE provisional List of Articles recommended to be introduced contains a large number of preparations possessing hypnotic and anæsthetic properties. Considered from a chemical standpoint, they are all closely related, being methane derivatives. The first of the saturated hydrocarbon series is CH_4. This compound is naturally the simplest form of a hydrocarbon, and forms the basis of other compounds. Taken as a class, they were always considered of the greatest importance, both in medicine and chemistry. Of the chlorinated anæsthetic compounds, that which is recognized as the most powerful is

Chloroform, Trichloromethane ($CHCl_3$). The pharmacist is not expected to prepare this compound, but required to purify the commercial product. This commercial product is not always preserved with the greatest caution, and consequently undergoes more or less decomposition in proportion to the exposure to air and light. The products of decomposition (hydrochloric, hypochlorous, and formic acids) and probable impurities (alcohol, aldehyde, and chlorine compounds) are eliminated with the greatest difficulty. The officinal process for purification is a very reliable and satisfactory one, provided the same is carefully conducted. In the details of the process the wording should be, "Distil, by means of a water-bath *containing water* at the temperature of 160° F., into a well-cooled receiver." "Continue the distillation, until nearly dryness, at a temperature not exceeding 150° F." In the process of distilling, it is necessary that the entire quantity of chloroform distils at once. Gradual increase of temperature admits of the distillation of aldehyde before its chlorination. The boiling point of chloroform, determined according to the method of Dr. Fischer, whose process of purification is the officinal one, was 59.6° C. According to Allen, the boiling point, 59.8° C., indicates one-half per cent alcohol. The U. S. P. tests for purity are all reliable, unless there be a complete absence of alcohol. Iodide of potassium will not react for free chlorine. Careful preparation and thorough purification of this compound are of the utmost importance, especially where the preparation is intended for internal administration. Of the officinal compounds into which chloroform enters, the Mistura Chloroformi should be discarded. Corresponding to chloroform in its molecular structure is

Iodoform, Tri-iodo-methane (CHI_3), which has a decided power as a local anæsthetic and antiseptic. Regarding the solubility, the U. S. P. proportions are correct; its solubility in absolute alcohol is 1 in 30, although Allen gives 1 in 25.

Unguentum Iodoformi should be discarded, since CHI_3 is prescribed in variable proportions; but if the preparation should be retained, a solvent (ether) should be specified. The next in order would be the hydroxyl substitution products. The first of these is

Methyl Alcohol (CH_3OH).—Its incorporation in the Pharmacopœia is in all probability for the purpose of denaturalization of ethyl alcohol, an object which should not be approved by the Committee. If intended as a solvent for organic principles, a preparation of exceptional purity will be required.

Acetic Acid.—Methyl carboxyl. A process for its preparation should be given. The source being definitely stated, probable impurities can be guarded against.

Empyreumatic bodies should especially be noticed. Squibb's test by means of permanganate of potassium is very good. The bisulphide-of-carbon test for water usually produces a turbidity with glacial acetic acid.

Pix Liquida and *Oleum Picis Liquidæ* should conform with each other; the source should be the same.

Creosotum.—Medical experience has proven the virtue of the preparation to be dependent upon the proportion of guaiacol. Beechwood tar furnishes the best preparation; this should then be its source.

Acetone is deserving of as much recognition as bisulphide of carbon or methyl alcohol. Its application in the manufacture of chloroform will necessitate a description of its chemical and physical properties. It is a solvent par excellence for most resins, gums, and guncotton.

Hypnone.—Although it does not strictly belong to the methane series, yet its structural formula would indicate acetone, in which the radical phenyl (C_6H_5) is substituted for one of the methyl groups:

Acetone: $\left.\begin{matrix}CH_3\\CH_3\end{matrix}\right\}C_4=O$ Hypnone: $\left.\begin{matrix}CH_3\\C_6H_5\end{matrix}\right\}C=O.$

It was introduced by Dujardin-Beaumetz. Possesses strong hypnotic properties. For physical and chemical properties see "Die neueren Arzneimittel" (by Dr. B. Fischer).

Alcohol.—Ethyl alcohol; Ethyl hydrate (C_2H_5OH). The density of alcohol has been determined by many, whose results differ, owing to the difficulty of removing the last trace of water. In estimating the percentage of alcohol contained in alcoholic solutions, it has been the writer's experience that a variation of 0.5° C. in temperature would produce a variation of 3 to 5 per cent in strength. A reference to Dr. E. R. Squibb's labors will show that it is utterly impracticable to insist upon definite, non-varying specific gravities and strengths. The method of the German Pharmacopœia, which allows a certain latitude, will meet with approval.

Squibb is correct in his statements as to tests for water. E. W. Davy detects 0.1 per cent of alcohol in water by adding a few drops of the liquid to a solution of molybdic acid in H_2SO_4. Application of the principle gave negative results.

Ethyl Iodide (C_2H_5I) has of late again come into use, and is perhaps worthy of consideration.

Ether.—Ethyl oxide ($(C_2H_5)_2O$. The method of the German Pharmacopœia should be pursued—a minimum and maximum spec. grav. with corresponding percentage by weight. In importance it is equal to chloroform, and should meet with the same precautionary measures.

Spiritus Ætheris.—Discard.

Spiritus Ætheris Compositus.—It will be necessary to arrive at some definite method indicating the presence of heavy oil of wine, provided it can be shown to possess medicinal virtues, otherwise discard the preparation and retain the former.

Paraldehyde, a powerful and reliable hypnotic, a polymeric modification of aldehyde. For physical and chemical properties, see "Die neueren Arzneimittel" (by Fischer).

Chloral substitution products of aldehyde:

Chloral Hydrate, erroneously called chloral. It is the hydrate of trichloraldehyde ($CCl_3CH(OH)_2$). The U. S. P. tests are very good. Should the iodoform test for alcoholate be positive, it would be desirable to have a quantitative test for chloral. See Allen's "Organic Analysis" (i., 172).

Butyl Chloral Hydrate, formerly known as croton chloral. I doubt whether the preparation will meet with favor with the medical profession. It is but little soluble in water; a suitable menstruum would be desired.

Acetic Ether.—Ethyl acetate ($CH_3COOC_2H_5$). According to Allen, "the solubility of water in acetic ether is 1 measure in 26 at 0°, and 1 in 24 at 15° C." The color of litmus paper changes upon the volatilization of the ether.

Spiritus Ætheris Nitrosi.—So much has been written on this subject that nothing remains to be said.

Sulpho-Substitutions.—Similar in structure to the alcohols are the mercaptans, but instead of being hydrates they are sulphydrates of the radicals, ordinary mercaptan being ethyl sulphydrate. Mercaptal is produced by the action of acetone on mercaptan, and this in turn is further oxidized by permanganate of potassium to form *sulfonal*, the medical properties of which are those of a hypnotic.

Ethyl Urethane.—This compound is closely related to carbonic acid, the hydroxyl being replaced by amidogen, and the H of the second hydroxyl group is replaced by the ethyl hydrocarbon radical, $\left.\begin{matrix}NH_2-\\C_2H_5O-\end{matrix}\right\}C=O$. It is a powerful hypnotic. See "Die neueren Arzneimittel."

Estimation of Sugar by Fehling's Solution.—H. Causse suggests the addition of 4 C.c. of a 5-per-cent solution of potassium ferrocyanide and 20 C.c. of water to each 10 C.c. of Fehling's solution employed. On running in the sugar solution to the boiling mixture, the potassium ferrocyanide dissolves the cuprous oxide as quickly as it is precipitated, and forms a colorless solution, thus rendering the exact point of decolorization more easily seen and preventing bumping.

Potassium ferrocyanide appears to be without action on hot or cold Fehling's solution. On cooling the liquid obtained after titration, it turns brown and deposits colorless crystals, which the author intends to study.—*Bull. Soc. Chim.* and *Jour. Chem. Soc.*

Euonymus and its Proper Menstruum.

FROM a paper contained in the *Pharm. Journ.* (December 14th), "on the root bark of euonymus and euonymin," by Messrs. Naylor and Chaplin, we derive the information that the active principles of euonymus are best extracted by a menstruum containing not less than 65 per cent of alcohol. The authors found that even hot water failed to extract from the bark any principle having a laxative or hepatic effect. Alcohol of 65 per cent yielded an extract having these effects in a decisive degree; and still better results were obtained by preparing an extract with alcohol of 84 per cent.

The authors recommend that the fluid extract of euonymus should be made with a menstruum prepared by mixing 4 vols. of rectified spirit (spec. grav. 0.838, Brit. Pharm.) and 1 vol. of water. [The U. S. Pharm. has a formula for an extract of a pilular consistence only, which is directed to be prepared by exhausting euonymus with diluted alcohol. It will be necessary to change this menstruum in accordance with the above quoted results.—ED. AM. DRUGG.]

In the preparation of the so-called "euonymin," the authors also recommend that the powdered bark should first be exhausted with water, then dried, and afterwards extracted with alcohol not below 65 per cent. The final product obtained after distilling off the spirit and drying the residue, when mixed with an equal weight of sugar of milk, will be found to contain enough of the brown resin to be easily reduced to powder. The dose of this will be from ¼ to 2 grains.

Scopola Carniolica.

AT a meeting of the Pharmaceutical Society held in December several papers were presented relating to the use of *Scopola carniolica* as a proposed substitute for belladonna. Prof. W. R. Dunstan, speaking of the rhizome, said it came principally from Austro-Hungary, that it is cheaper than belladonna, and that the supply is practically inexhaustible. Two species were known and had been examined: *S. japonica*, which had been investigated by Eykman, and is said to yield the alkaloid scopoleine—almost identical with atropine; and *S. Hladnikiana*, a rare exotic, said by Schmidt to also contain an alkaloid. Chemical examination readily detected an alkaloid, but the separation of each constituent involved the expenditure of much time, it being thought that more than one mydriatic alkaloid was present. Hyoscyamine had been separated and identified, and it was claimed that a new and important source of that alkaloid had been discovered.

Prof. Dunstan and A. E. Chaston stated that scopoleine, instead of being a new alkaloid, as claimed by Prof. Eykman, approximated to a mixture of atropine, hyoscyamine, and hyoscine. A fluorescent material, and a fatty body said to be cholesterin, had also been isolated by Eykman. Prof. Schmidt had recognized hyoscyamine in *S. Hladnikiana*. Dunstan and Chaston had examined *S. carniolica* in carefully selected specimens which had been air-dried, powdered finely, and extracted with cold alcohol, and the percolate evaporated between 30° and 40° C. To extract the fat, the semifluid mass was shaken with acidulated water and alcohol, and the chloroform solution separated, evaporated, and examined. The acidulated water containing the alkaloid was treated with a slight excess of ammonia and extracted with chloroform. Evaporation of the chloroform yielded an impure, highly colored alkaloid. This was purified by solution in dilute acid, adding ammonia and extracting with ether. The amorphous residue, after treatment with anhydrous ether and repeated recrystallization, yielded crystals of great purity. The melting point of these crystals was—for the first fractionated crystals, a m. p. of 108.4°; the second fraction had a m. p. of 107.7°, and a further, one of 106.9° C. These crystals possessed all the properties of hyoscyamine.

Mr. F. W. Ransom reported upon the pharmacy of *Scopola carniolica*. Twenty-five Gm. of powdered rhizome were percolated with a mixture of equal parts of absolute alcohol and chloroform, continuing with hot percolation. After washing the precipitate with dilute acid and then with chloroform, the aqueous solution was rendered alkaline with ammonia, extracted with chloroform, and the chloroform evaporated. By this means was obtained 0.134 Gm. of residue, or 0.54 per cent. When dried at 212° F., it lost 25 per cent of weight and equalled 0.43 per cent. These results were slightly higher in alkaloidal value than were obtained from three samples of belladonna root. The experiments to determine the preferable menstruum favored a mixture of 4 parts of rectified spirit with 1 part of water. A solid extract made by using only rectified spirit for extraction and a liquid extract of standardized strength, would enable a tincture to be made by mere dilution with spirit; or a liniment, with spirit and camphor; or an ointment, by mixing 1 part of the solid extract with 9 parts of benzoated lard.

Dr. Dyer Duckworth found that a half-grain of extract of scopola would check night-sweating, and that the extract acted as an anodyne when externally applied. Its general action resembled that of belladonna.

Mr. E. M. Holmes stated that the plant is native in southeast Germany and throughout the whole of Austro-Hungary; is very similar to belladonna in leaf and flower, but grows only to a height of one to two feet. The principal distinction between belladonna and scopola is that the former has a root stock and black, indehiscent fruit, while scopola has a rhizome and a fruit that dehisces transversely, like henbane. The leaf is more reticulated than that of belladonna, and has a more glistening exterior. It grows in damp woods on a calcareous soil. The rhizome contains cells with raphides, similar to belladonna, but quite unlike henbane.—*Br. and Col. Drugg.*

Commercial Oil of Cinnamon.

MR. FRANK E. BALLARD, manager for Messrs. A. Moore & Co., of Smyrna, sends the following interesting note on the commercial tests for oil of cinnamon to the *Chem. and Drugg.* (December 28th):

While living in Ceylon, it was often my duty to examine and report upon various samples of the cinnamon oil of commerce, and to write certificates as to its specific gravity, it being the custom for Colombo merchants to send a sample of the article to a chemist for examination before accepting a consignment from the native producer, or giving an advance upon it pending its transmission to and sale in a European market.

This special work was quite new to me, so I began reading up the subject as far as possible, and at the outset found some little difficulty, by reason of the variations in specific gravity given by the various authors I consulted, no two of them being alike. Books failing me, I began questioning the buyers I met as to the means they adopted.

A gentleman told me he tested his samples by allowing single drops of the oil to fall into a glass beaker of water, and judged by the relative rapidity or slowness with which they reached the bottom as to their freedom from adulteration, the deduction being that the lighter the oil the slower it travelled, and *vice versa*. Rather a risky and unsatisfactory operation, anyhow! Another buyer staked his money on his taste, and defined a good oil as one which tasted very sweet in the mouth, and left no hot, peppery after-flavor. This test, I afterwards found, had a certain amount of value. The specific gravities given in the books I consulted varied between 1.026 and 1.035, which leaves a very wide margin of doubt and uncertainty when applied to such a product as cinnamon oil.

I next tried to get a guaranteed specimen of pure *quill* oil as a standard. This was unobtainable, no merchant being able to state from what part of the plant any oil he had had been distilled. It would not have done to depend upon a native specimen, so I was under the necessity of distilling it myself. This was done, and by careful collection I got 1¾ oz. of oil from 12½ lbs. of bark, all quill.

But such an oil! Beautiful to see, delicious to smell, and as different from the native product as creosote is different from crystal carbolic acid. It was of a bright pale golden color, sweet taste, rapidly diffused, and leaving no bitterness on the tongue. Its spec. grav. was 1.019.

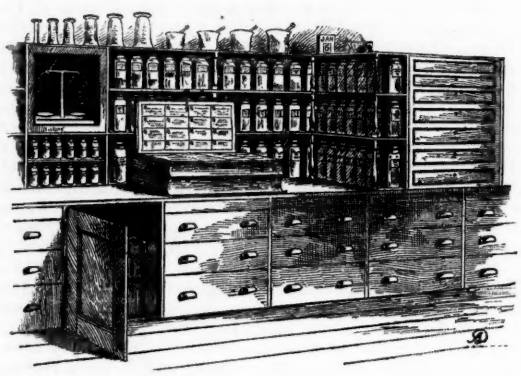
Now, whence came such abnormal spec. grav. as 1.026 and 1.035 I shall be able to show. On inquiry from distillers I found that they can produce, practically, as many grades of oil as they please at specific gravities between 1.019 and 1.045. The finest and lightest oil is the product of quill bark alone, and will not vary in spec. grav. more than between 1.019 and 1.021. A second quality is produced from chips, root bark, broken quill, and the cinnamon *débris* of the factory generally. The spec. grav. of this oil will vary between 1.025 and 1.032. A third oil is distilled from the leaves alone, and is very different in its characters from the other varieties. It is light brown in color, and sweetish, but it leaves an acrid, burning taste on the tongue, and its odor is rough, and when smelled after a fine quill oil it is decidedly unpleasant. Its spec. grav. varies, but, as a rule, will be from 1.040 to 1.045.

With these data it is easy to understand the errors in description of specific gravities given by various writers on materia medica and pharmaceutical chemistry. They never had a pure sample of oil for examination, but simply the common market variety, which is never—so far as I could learn from native distillers—prepared from quill bark alone, but is, as a rule, a mixture of the varieties named, in varying proportions. It would not pay them to send home a first-class oil, for the highest prices paid seldom pass 1*s.* 10*d.* per ounce, and frequently an ordinary oil has been left unsold at 6*d.* or 8*d.* Consequently they send the bark to Europe, and make their oil from the refuse, and hence the spec. grav. is given in the United States Pharmacopœia as 1.040, and in Muter as 1.035; while MM. Salet, Girard, and Pabst, in the *Agenda du Chimiste*, give 1.033, and Hager 1.005 to 1.030. The British Pharmacopœia gives the *coup de grâce*, and tells us with the most charming naïveté that "it sinks in water." What a lucid definition!

Cod-liver Oil saponified with an equal amount of lime water, and flavored with essence of vanilla or citron, is said to form a syrupy liquid free from the natural odor of the oil.

PRESCRIPTION FILING.

WRITING to the *Pharmaceutical Record* of January 6th, Mr. Joseph T. Estes, of Rockland, Mass., says, respecting the methods of filing prescriptions: For one I say, paste them in a book, by all means, and always keep the original, if possible, giving a copy to the customer if he asks for his prescription. I filled eleven books by copying, but gave it up long ago—life is too short and busy to waste in this way. If there is a supposed error you have no proof in your copy, but if you have the original to refer to all is well. I am now on my seventh book filled by pasting. The book used is substantially bound and is 10½ x20 inches, 3¾ inches thick (inside measurement), and holds between 7,000 and 8,000 prescriptions. The leaves are strong manilla paper. I always keep two books on the prescription case, the one last filled and the one being filled. It takes no more room, and raises the one most in use, so that it is much easier to read the not always plain writing. I keep the book open by a brass rod with an eye which is screwed to the edge of a shelf, and which when dropped is long enough to hold the leaves in place, and which when not wanted is hooked up out of the way. The books are bound in the usual style, but in use are in the position shown in the illustration. In pasting I begin at the left-hand upper corner and follow down both pages. In this way reference is easier, and it gives four columns of prescriptions to the page.



Estes' Prescription File.

DESSAU'S POWDER DIVIDER.

MR. W. F. DESSAU is the inventor of a machine described in the *Western Druggist* as capable of securing the accurate division of powders to the number of 48, and from ½ to 30 grains in size.

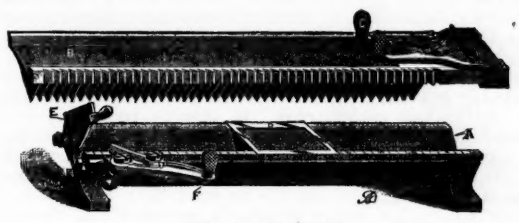
A represents a V-shaped trough or receptacle for powder, graduated and numbered on top from 1 at closed end to 48 at open end. B shows forty-eight V-shaped blades which fit perfectly into A, each blade corresponding to a graduation on A. C is a lever and clamp which fastens and holds B to A when in use. D is a sliding, V-shaped partition, fitting perfectly into A. E is a swinging end gate to A. F is a spring and lever which moves B forward one notch when B is placed in A. The entire machine is made of steel, nickel-plated, and is very durable.

Directions for making fifteen powders: Close end gate E; slide D to No. 15; place powder in A between E and D; level powder perfectly by tapping A on counter or with end of spatula; now place D into A, pressing blades through powder, which is then divided. Spread fifteen powder papers on counter; hold divider in left hand with end E over paper, and open E, which permits B to move forward and drop first powder on paper by pressing lever F once. Pass on to each paper, pressing lever once over each one, when powder drops out. The powders are then folded.

ANOTHER powder-divider, invented by W. J. Hull and described in the *Western Druggist*, acts in much the same manner, with the difference that the dividing blades are radial instead of parallel. Fig. A represents the revolving cogged plate or ratchet-wheel, with twenty-four equidistant blades which closely fit the receptacle and serve to divide the powder and, as the plate is revolved, bring each portion of the powder to the discharging place. Fig. B shows the receptacle or tray (1), the subdivider (2) with the indicator (3) and the ratchet (4). The subdivider being removed from the central pivot, the powder is placed in the tray and easily distributed over the trough. The divider A is then dropped into place, separating the powder into even portions; the discharge gate being then opened, and the wheel turned the distance of one ratchet for each powder to be discharged. When less than twenty-four powders are required, the subdivider is first put in place, and with the aid of the movable and the fixed diaphragms the number of powders to be formed are regulated.

East Indian Gums.

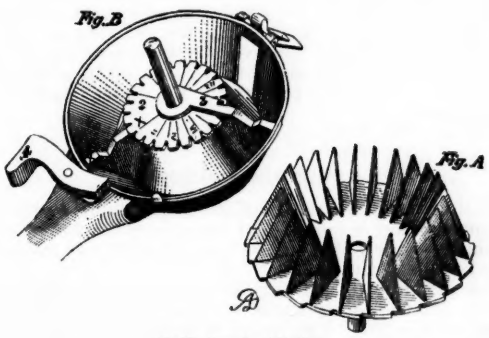
MR. J. H. MAIDEN, of the Technological Museum of Sydney, New South Wales, has recently issued a communication on the "Similarities and Dissimilarities of Sterculia Gum to Tragacanth," from the report of which, in the *Chemist and Druggist*, we extract the following: Gums produced by totally different plants, such as *Cochlospermum Gossypium* and *Sterculia urens*, though similar in appearance, are so nearly alike that it is difficult to separate them when mixed. This illustrates the importance of specimens of the plants themselves for



Dessau's Powder Divider.

those who have charge of collections of gums, resins, and similar products, as means for their identification.

In connection with this subject, and bearing some relation to that taken up by Mr. Maiden, we may refer to some few gums of Indian origin that bear some resemblance in substance, though not in appearance, to the tragacanth-like series. Thus, under the name of "Mochras," or "Mocherus," several dark-colored but transparent gums are known in India; that generally going by this name, however, is usually ascribed to *Bombax malabaricum*, a large tree belonging to the tribe Bombaceæ of the natural order Malvaceæ. It seems that no amount of tapping or notching, or even cutting deeply into the bark or sapwood, will produce the smallest exudation of any gum or mucilage; but when the bark is diseased a sort of jelly flows abundantly in spring as the sap rises. From observations made in India of a large living bombax tree, a part of the trunk of which was swollen from disease and the bark split and decayed, a yellowish, jelly-like substance had exuded from all the wounds, described as



Hull's Powder Divider.

being "sometimes like a mere tube of paint squeezed out of an oil-color tube, and at others forming a mass of the size of a large tomato." On exposure to the air the outside of this mass soon hardens, after turning brown, and the whole mass then dries up and collapses, or rather shrivels into an irregular, wrinkled, and hollowed lump, of a dull brown color and brittle but somewhat mucilaginous if softened in the mouth. Fresh "mocherus" from this tree, when put in either hot or cold water, was found to soften and swell and to disintegrate, though it was not absolutely soluble. Upon chemical examination it was found to contain a certain, though not a large, amount of a modification of tannic acid and a red coloring matter, which was destroyed by acid and restored by alkali. The drug is used in India as an astringent and for various mucous derangements, in menorrhagia, and as a styptic.

A very similar or identical gum is said to be derived, in some parts of India, from the areca or betel palm (*Areca Catechu*), while in Lahore "Mocherus" is declared to be produced by the Sohájna tree (*Moringa pterygosperma*), a leguminous tree 30 feet to 35 feet high, and known to Europeans as the horseradish tree, in consequence of the root having a pungent taste and being used as a substitute for that condiment. The gum from this tree, though its exterior appearance is not very dissimilar to that just described, shows upon fracture a dark rose color with a very waxy appearance. It varies, however, "in color from a red to a semi-opaque pink to almost white"; and

in form from irregularly-rounded tears to longish stalactitic pieces. Though hard and brittle, it softens and swells in the mouth; and placed in water forms a firm jelly. The gum which most nearly approaches this is that produced by *Eriodendron anfractuosum*, a widely distributed Indian tree growing some 50 feet or 60 feet high, closely allied to *Bombax malabaricum*, and sometimes known as the cotton tree, in consequence of the fruit being filled with a mass of silky cotton in which the seeds are embedded. It has been stated that gum kuteera, which is now referred to species of *Sterculia*, is the product of *Eriodendron;* but this would seem to be a mistake. Anyhow, the gum received from India as the produce of *E. anfractuosum* is of a dark reddish color, transparent, and swelling in the mouth in the same way as the gum of *Moringa*.

From *Stereospermum chelonoides*, a tree found throughout the moister parts of India, and belonging to the natural order Bignoniaceæ, a red-colored gum exudes not unlike those previously referred to. It is, however, of a brighter fracture. Little seems to be known about it. Another deep red gum, externally very dark and opaque and only partially soluble in water, is said to be furnished by *Ailanthus malabarica*. It occurs in rather large, roundish tears, and is said to be sometimes used in India as a remedy in dyspepsia. Dymock says: "It yields a fragrant resin known as Muttee pal on the Annamallays, which may become valuable as an article of trade. Reduced to powder, mixed with milk, and strained, this resin is given in small doses in dysentery and bronchitis, and is reputed to be an excellent remedy, owing to its balsamic properties." Mr. Broughton, some time Government Quinologist, describes it as dark brown or gray, plastic, opaque, and with an agreeable smell. It is often very impure; but the pure resin is soft, of the consistence of thick treacle. When burnt, it gives off a fragrance, and hence it is sometimes used for incense. The perfume is, however, inferior to those resins usually used for this purpose. The tree belongs to the natural order Simarubeæ.

Drury, in his "Useful Plants of India," states that *Macaranga indica*, a euphorbiaceous tree very common in Travancore, exudes a gum resin from the cut branches and base of the petioles. He describes it of a light crimson color, and says that it "has been used for taking impressions of leaves, coins, medallions, etc. When the gum is pure and carefully prepared, the impressions are as sharp as those of sulphur, without its brittleness. Powdered and made into paste, it is reckoned a good external application in venereal sores."

It will be seen from the foregoing remarks that trees of very distinct natural orders are credited with furnishing gums of very similar characters. Much confusion, however, no doubt exists as to the accurate identification of the sources of some of these gums, and this is but one question out of many connected with vegetable products that requires to be thoroughly worked out by some qualified person or persons resident in the districts where the plants grow.

Antipyrine and Iodine.

M. MANSEAU finds that antipyrine combines with a definite proportion of iodine, and bases thereon a method by means of which the purity and identity of antipyrine may be [?] determined.

One gramme of antipyrine is dissolved in 100 C.c. of water. To the solution are added about 10 C.c. of starch solution (1 in 100). The liquid is heated to 40°–42° C., and next there is added, drop by drop, and under constant stirring, a solution of iodine containing 14.39 Gm. to the liter, until there is a persistent blue tint. According to the author, if the antipyrine is pure, 6 C.c. of the iodine solution will be consumed, which corresponds to 0.08634 Gm. of iodine.

The author has met with antipyrine of "foreign origin" [apparently that made at the home factory in Germany, since there is no other one to our knowledge] which was less handsome than the one above reported on, and which absorbed only 0.07241 Gm. of iodine.—After *Rep. de Pharm.*, 1889, 298.

[It is not clear to us what sort of a compound iodine can form under these circumstances. Supposing that antipyrine, $C_{11}H_{12}N_2O_2$, could form substitution compounds with iodine, the lowest member of the series would be $C_{11}H_{11}IN_2O$. As antipyrine has the molecular weight 188, the moniodo-antipyrine would have the mol. w. 314 and contain 40.4 per cent of iodine. According to Manseau, however, 100 Gm. of antipyrine would appear to combine only with 8.634 Gm. of iodine. This would be almost equivalent to a proportion of 8 molecules of antipyrine to 1 atom of iodine. We doubt very much whether this method of testing antipyrine is of practical utility.—ED. AM. DRUGG.]

Chloral Hydrate in solution of 5 grains to the ounce of water is said to be an efficient application to the scalp for the relief of dandruff, and the loss of hair which commonly attends it.

Antipyrine Incompatibility.

MR. CHABROL describes the difficulty met with in dispensing powders containing each 0.10 Gm. of β-naphthol and antipyrine, and 0.25 Gm. of salicylate of bismuth. In whatever order the substances were mixed, the product was a liquid paste. The difficulty was overcome by mixing the antipyrine with five times its weight of sugar, and then adding the naphthol and bismuth salicylate. The trouble seems to be due to the incompatibility of the first two rather than to the antipyrine and bismuth salicylate. —*Pharm. Journ.*

Sales of Drugs by Auction.

PERIODICAL drug auctions have been held in London for generations, and there is not at present any prospect of their discontinuance, though occasionally voices are heard in advocacy of their less frequent occurrence. We should be disposed to think that no small part of the pre-eminence of our port as a centre for the drug trade is due to these auctions, and that the publicity which attends all transactions at the sales is of immeasurable service in attracting shipments of drugs from all parts of the world to London warehouses. The only other markets, so far as we are aware, where public auctions of drugs and goods of similar character are now held at fixed intervals, are Amsterdam and Rotterdam, and the transactions in these cities are confined to varnish gums and cinchona. But the extension of steamship communication, the striving of continental nations for colonial acquisitions, the extraordinary growth of the industrial importance of Germany and the United States, and a variety of other causes, have called into existence during the last twenty years a number of drug markets of some importance where there is a disposition to look upon London with some jealousy. These markets are still forced to follow our lead, and probably will continue to do so for many years; and both New York and Hamburg, our principal competitors, are at the same time our best customers for raw drugs. But as the great continental states grow in commercial importance, and their inhabitants advance in purchasing power, we must be prepared to see them gradually emancipate themselves from our leadership, and get ready for the time when we shall have to look upon them as competitors in the less developed markets of the world, rather than as customers of ours. To a large extent these conditions already prevail in manufactured goods, and presently the same will be the case with raw or partly manufactured articles, such as the drugs which pass through the London auctions.

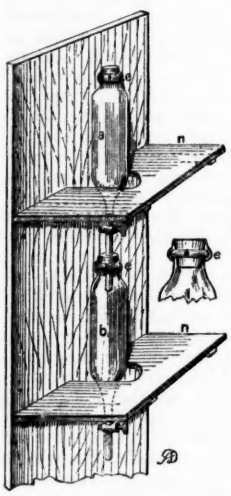
It is therefore a matter of surprise that no serious attempt should ever have been made to copy our drug auctions in such places as Hamburg, Havre, Marseilles, or New York. From time to time rumors have arisen that steps in this direction were about to be taken, but no definite results have followed. The fact that London is the only market where foreign shippers can put the actual value of goods to the reliable test of open competition explains, probably, why a large number of goods shipped from Chinese and Indian ports to Hamburg, by the new German mail routes, are regularly transshipped hither to be sold by public auction. But the first indication in this direction comes from neither Germany nor America. We understand that a determined attempt to establish public auctions' for drugs is now about to be made in Paris. In that city there have been hitherto occasional drug sales under the auspices of three or four brokers and agents, some of whom were formerly rather intimately connected with the London market. But these auctions consisted generally of goods seized under judicial warrants, or which had otherwise to be disposed of, and not drug auctions in the London sense. We have at this moment before us a catalogue of such a "vente judiciaire" which took place at the Magasins du Château-d'Eau last Saturday, when about 11 tons of Senegal and Aden Arabic gums, 2 cases soap, 2 boxes aniline black, and a quantity of other goods were offered for sale. Another and larger sale of drugs, the stock of a firm whose business had been liquidated, took place a few days previously, and it is said that the excellent prices realized on that occasion have given a strong stimulus to the party who favors regular drug auctions on the London system. It is claimed by that party that public auctions would considerably curtail the charges on drugs now falling upon importers, who would then be able to dispense with private warehouses and sell goods direct from the docks or entrepôt. On the other hand, information we have collected from the wholesale trade in Paris shows that in their body, as distinguished from the brokers and certain agents, the public auction scheme does not meet with much enthusiasm. One firm gave it as their opinion that the plan would probably be successful if the Havre importers could be induced to support it; but on the whole it seems likely that the Parisian wholesalers are scarcely the people from whom much assistance can be expected.

Another imitation of British customs has, however, been recently adopted by the Parisian wholesale druggists. They now meet on 'Change three times a week, on Mondays, Wednesdays, and Fridays, from 2:30 to 3:30 P.M.,

at the new Bourse du Commerce in the Rue du Louvre, which is in close proximity to the centre of the drug quarter. This innovation is due to the efforts of the same brokers who are prominent in the public auction agitation, and we are informed that the wholesale trade have taken to this scheme with much more enthusiasm than they displayed toward its sister project, and that the majority are heartily supporting the Bourse meetings. That their customers will hail the scheme with satisfaction cannot be doubted by any one who has had experience of the inaccessibility of the Parisian wholesalers, and of their tendency to make their would-be purveyors cool their heels in an antechamber for hours in anticipation of being ushered into the presence of the principal.—*Chemist and Druggist.*

A NEW CONTINUOUS EXTRACTOR.

Most of the many apparatuses for making extracts are inapplicable when it is desired to make extracts of volatile substances, or of substances which would be decomposed by distillation or by warming. The annexed figure shows an arrangement by which the most concentrated extracts or tinctures of spices or perfumes, etc., can be made without evaporation. A number of cylindrical glass vessels, *a*, *b*, are placed on a suitable stand one above the other, so that the tube of one vessel passes through a cork fitted into the mouth of the vessel below. From six to twelve of these vessels may be used one above the other. The stand consists of a board with pairs of projecting pegs placed at such distances that there is room for the cylinders between them. Boards having a horse-shoe-shaped piece cut out on one side are placed on these pegs, and serve to support the cylinders in their places. The material from which the extract is to be obtained is placed in these cylinders, a little asbestos or cotton-wool packing having been first inserted. The solvent is then allowed to run into the top cylinder, either freely or (in order to increase the pressure) through a long tube attached to the top. The liquid permeates the substance in the cylinder, and runs through into the cylinder below, and so on to the bottom, where it is drawn off as the strongest possible tincture. By adjusting the lowest stopcock, the speed of flow can be properly regulated. The number of vessels and the speed of percolating should be so regulated that the tincture begins to flow from the lowest cylinder just when the contents of the top one have been thoroughly exhausted. As soon as the top cylinder is exhausted it is removed, the whole column of vessels raised up a stage, and a newly-filled vessel is added at the bottom. In this way the process becomes continuous, and a concentrated extract can be made, except, of course, towards the end of the operation. When alcohol, ether, and similar solvents are used, the liquid remaining in the vessels at the end of the operation may be recovered by emptying the cylinders and distilling off the liquid from the spent material, or steam may be blown through the column from the top downward, when the spirit is driven out and may be collected below fairly well separated from the condensed water. Samples of the tincture may be taken at various stages by double boring the corks and attaching a tube with a stopcock, through which a portion of the extract may be drawn as required; or a three-way tap may be used with branch tube instead of the ordinary tap arrangement.—A. Ungerer in *Zeitsch. f. ang. Chem.* and *J. Soc. Ch. Ind.*



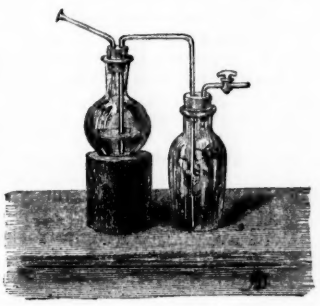
Ungerer's Continuous Extractor.

Iodoform Direct from Seaweed.

There has been started recently at Poterie-de-Belbeuf, Rouen, the manufacture of iodoform direct from the waters of lixiviation from varech. The clear desulphurized solution is thoroughly beaten with mechanical agitators after the addition of a certain proportion of caustic soda, and the iodides are transformed into iodoform by adding acetone and hypochlorite of soda. The iodoform which is precipitated is washed, dried, and crystallized from alcohol or other suitable liquid. It is maintained that the persistent and disagreeable odor of iodoform is due to the use of alcohol in its manufacture, iodine being liberated, and rendering possible the formation of iodized organic bodies as by-products which are of strong odor. Acetone-iodoform is made without the liberation of iodine, and can be produced in very dilute solutions, both conditions being highly favorable to the production of an absolute and inodorous iodoform.—*Chem. and Drugg.*

A SIMPLE SUBSTITUTE FOR KIPP'S APPARATUS.

The accompanying sketch represents a simple contrivance for supplying a continuous and steady stream of carbonic acid. The flask, with a capacity of 500 to 600 C.c., contains hydrochloric acid. The bottle, fitted with a tap tube, contains chips of marble. They are connected by a tube in the form of a siphon reaching to the bottom of each. The flask is also provided with a tube similar to the shorter tube of a wash bottle, and for a similar service; it has been represented in its present position for convenience in drawing, but should be turned through 90° toward the reader for convenience in operation. When the evolution of gas is required, the tap tube is opened and the pressure within the flask increased just sufficiently to fill the siphon tube with acid. Directly acid enters the bottle, gas is evolved and more acid flows over. If it is desired to stop the evolution the tap tube is closed, and the pressure exerted by the gas confined in the bottle rapidly drives the acid into the flask again and empties the siphon. If a steady and continuous stream of gas is required, the opening of the tap tube can be regulated, with a little trouble, in such a manner that, when once the siphon tube has been filled with acid, only a small quantity will run into the bottle, because the pressure of the gas, being allowed only limited freedom in egress, is sufficient to prevent an excessive quantity of acid from flowing in. But, as the hydrochloric acid in the bottle becomes saturated with calcium chloride, its action becomes less vigorous, and the pressure of gas would be diminished but for the fact that additional acid, thus permitted to flow over very gradually, is just sufficient to keep it at the same height.



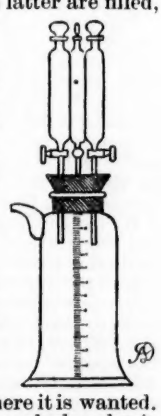
Thompson's Substitute for Kipp's Apparatus.

In the same apparatus, the marble may be replaced with zinc or with sulphide of iron for the preparation of hydrogen or of sulphuretted hydrogen respectively. It is, in fact, a simple substitute for Kipp's apparatus. One advantage, not altogether inconsiderable, which gives it a preference to the latter, is that it requires a far smaller quantity of acid; that which has not dissolved calcium, iron, or zinc chloride remaining in the flask till required, does not mix readily with the portion already saturated, and, when all is saturated, it is easily replaced by a fresh quantity.—Eustace Thompson, in *Chem. News*, November 8th, 1889.

A SIMPLE APPARATUS FOR GENERATING OXYGEN GAS.

C. F. Göhring recommends the below-described method and apparatus for preparing pure oxygen gas on a small scale.

A large flask with spout, of the shape shown in the cut, and graduated, is provided with a rubber stopper through which three stoppered funnels pass. The latter are filled, respectively, with concentrated water of ammonia, solution of permanganate of potassium (5 Gm. in 1 liter), and concentrated phosphoric acid. In order to afford to the eye a criterion to ascertain when the contents of the flask or reservoir are alkaline or acid, the ammonia may be tinted with phenolphthalein, or the phosphoric acid with methyl-orange. The flask or reservoir is filled about two-thirds full with peroxide of hydrogen solution.



To generate oxygen, ammonia is allowed to flow into the flask until the contents are rendered alkaline (and show the phenolphthalein tint, if this indicator has been used). Solution of permanganate is then allowed to flow in, in drops, when oxygen will at once be given off, which may be conducted by suitable tubing to where it is wanted. When the current is to be interrupted, enough phosphoric acid is allowed to run in to neutralize the ammonia and render the liquid acid. When the current is to be started again, the liquid need only be supersaturated with ammonia. Thus the current may be started and stopped until the peroxide is exhausted.

If the strength of the peroxide has once been determined by acting upon a measured quantity in the flask by the process here described, it will be easy to predetermine the quantity of peroxide to be used in order to obtain a certain quantity of oxygen.—After *Chem. Centralbl.*, 1889, 114 (from *Chem. Zeit.*)

The Licorice and Agrumi Industry in Sicily.

FROM a very interesting series of papers by Prof. F. A. Flückiger, containing sketches made during his Easter vacation in southern Italy, we select a few notes, after the *Archiv der Pharmacie* (December, 1889).

1. *The Licorice Industry in Sicily.*

Licorice (*Glycyrrhiza glabra*) grows wild or has run wild on moist ground in the plain of Catania, but not on volcanic ground. It certainly is not specially cultivated there. In the sheds and yards of the licorice factories very considerable supplies of the roots, or rather root branches (runners), are met with. Prof. Flückiger was given every facility to see the process of licorice manufacture in Via Molino a Vente. The operation is quite simple, and is conducted during the winter, between October and April. The roots are washed, cut, crushed upon a stone, then twice boiled with water in flat iron pans (caldaje) holding 250 liters (about 66 gallons), and subjected twice to pressure, the work at each pan, with the quantity mentioned, consuming about one day. The boiled root is transferred from the pans into basket-like receptacles (frantojo, sporta di pezzuola, made from chestnut shavings), where they are pressed. A more perfect arrangement (called gabbia) consists of a wooden framework into which fit eighteen perforated iron plates (lastre di ferro), between which the roots are placed. The expressed juice is clarified by merely allowing it to stand. The last portions are poured upon a fresh lot of roots. The same pans (caldaje) are also used for inspissating the juice, heat being applied at first by means of coal, and afterwards by charcoal. Each pan yields about 400 kilos of "pasta," which is immediately cut up by females upon an oiled table made of walnut wood. The mass is either formed into blocks (pani or blocchi) weighing 5 kilos, which are wrapped in blue paper and of which 20 are packed into a case (cassa); or the mass is formed, by the aid of gutter-like forms made of marble or brass, into sticks (bilie) of equal size, which are stamped, and then rapidly washed in order to remove the oil with which the sticks have become coated during the rolling. The final drying is accomplished in hurdles (tavole) in the store rooms, by exposure to the summer temperature. No artificial heat is used for drying. There is no chance of the licorice coming into contact with copper during the boiling [as has been asserted; or as has been shown to be present in certain other kinds of licorice. See, for instance, *Pharmacographia*, page 186.—ED. AM. DRUGG.]

2. *The Agrumi* (Products of the Citrus Family).

There is scarcely any locality where the "agrumi" are cultivated on a larger scale than in the coast district between Catania and Messina [east coast of Sicily]. Lemons occupy the first rank; next comes the sweet orange (portogallo or arancio dulce), the bitter orange (arancio amaro, the "bigarade" of the French); and lastly the citron (cedro), which is only used for making preserves. A similar use is made of the so-called limoncelli or piretti, which contain only a small quantity of a scarcely sour juice.

Another member of the Citrus family, the bergamot, is cultivated on the other side of the Straits of Messina, at Reggio. The most detailed account of agrumi is contained in the extensive work of Professor Penzig, of Genoa: "Studi botanici sugli Agrumi e sulle Piante affini. Roma, Annuario di Agricoltura, 1887."*

Lemons grow in such immense quantity that their manipulation and export constitute one of the chief industries of Messina.

The handsomest fruits are carefully picked out, separately wrapped in fine paper, and packed by females into boxes holding three hundred to four hundred each. They are shipped to all parts of the world, though the export to the United States has decreased, owing to the increasing competition of Florida and California. Inferior lemons (scarti) are packed in tuns with salt water (salmaja [salamoja]). Large numbers of these may be seen in the harbor, being destined for northern countries, where these lemons are used for culinary purposes.

By far the largest proportion of lemons is consumed in the preparation of oil of lemon and citric acid. The ethereal oil is contained in the outer rind of the fruit, in cells which merely want to be punctured or torn to yield their odorous contents. Though the regular period of manufacture was over at the time when Prof. Flückiger visited the locality, the operation was practically performed for his special benefit by the courtesy of the firm Gaetano Alessi fù Giuseppe. The process employed is the very simple one, "alla spugna" (the sponge process). The workman cuts the lemon into quarters, removes the acid flesh, and presses the rind against a sponge which he holds in his right hand. The oil cells are thereby ruptured and yield their oil to the sponge, which is pressed with the hand when it has become saturated with oil. Owing to the unavoidable contamination with aqueous juice the oil is at first turbid, but soon separates, and may be poured off perfectly clear. During the best season (October, November), 3,000 lemons yield at most 1 kilo of essential oil, which differs slightly in quality according to the varieties of fruit, the time of collection, etc.; but the differences are only recognizable by experts. The sponges used are medium-sized "horse sponges." After having been used for about ten days they become useless (spugna consumata), owing to brittleness and inability to take up oil.

So far as the quality of the oil is concerned, the sponge process leaves hardly anything to be desired, since the oil possesses the full aroma of the fruits. It is, however, clear that a considerable portion of the oil fails to be extracted by it, and various attempts have been made to introduce better methods for a more complete exhaustion of the lemons. Up to the present, however, these attempts have failed to do away with the old time process. Labor is cheap and lemons are so abundant that there appears no necessity of trying to extract the oil to the last drop, particularly if the manufacturer owns large plantations himself. For this reason also it is not very likely that lemon oil is adulterated, though there are said to be a few fraudulent manufacturers.

In the case of the bergamot the conditions are different. This fruit, which mostly remains green, and which is cultivated in quantity probably only near Reggio, on the mainland of Italy, opposite Messina, differs from the lemon in being globular and without a nipple. For this reason the sponge process is no longer used at Reggio, but the fruit is rolled over copper points which are fixed, comb-like, in a revolvable wooden cylinder. [Prof. Flückiger refers here to his *Pharmaceutische Chemie*, ii., 405, where a somewhat different apparatus is described. It consists of a strong tinned-iron basin, the bottom of which is bent strongly upward in the middle, and the interior of which is provided with sharp ridges. It is fitted with a very heavy lid, likewise sharply ribbed, which is set in rapid circular motion by a toothed wheel. About six to eight bergamots are introduced into the apparatus, and the rotation of the lid whirls these about, tearing the oil cells. The oil runs off through small holes situated in the bottom of the basin, and is caught by a cylindrical vessel into which the apparatus is fitted.] This process is much cleaner and extracts the oil more completely, which is of some importance, as the bergamot is not cultivated so abundantly. The oval and irregular shape of the lemons makes this process impracticable for the latter.

In the case of the oils of the Citrus family a special constituent, as bearer of the aroma, is less easily separable than in many other oils where the aroma may be materially improved by the removal of certain more volatile hydrocarbons possessing a less fine odor (as, for instance, in oil of caraway, anise, etc.). Although this operation may be applied to some extent to the oils of the "agrumi," yet most of the oil of lemon and bergamot is put on the market in its natural condition without being subjected to distillation. In Messina and Reggio, where by far the largest quantities of these oils are manufactured (much more than 100,000 kilos of both annually), nobody even thinks of distillation. This would only come into play where such products as the oil of orange flowers, oil of neroli, are to be obtained. No other process but distillation would answer for this purpose.

The separated pulp of the lemons, as well as the fleshy parts of the bergamots, are used for preparing citric acid. The lemon contains a larger quantity of this than the bergamot, which yields about one-fourth less. The juice is expressed from the flesh in basket-like receptacles (sporte di giunco, made from a species of Juncus, perhaps obtusiflorus or silvaticus ?). These same baskets, which are made in Messina, are also exported to Toscana and the Riviera for pressing olives, and are used elsewhere in Italy for similar purposes.

To obtain 1 liter of juice more than 30 lemons are required. The largest proportion of citric acid (at most 10 per cent) is obtained from fruits gathered from December to February.

The expressed juice (agro) is slowly concentrated in an iron pan (caldaja) holding about 6 hectoliters (158.5 gallons), the density being determined by means of a so-called "citrometer" imported from Manchester. It is to this city, or at all events to England, that the largest proportion of the concentrated juice (agro concentrata) is exported. Fresh lemon juice shows 7° by the citrometer; after concentration it shows 60°, corresponding to a specific gravity of 1.233 to 1.235. Large invoices of the concentrated juice are regularly assayed both at Messina and in London to determine the actual proportion of citric acid. It is usually assumed that 1 gallon (imperial measure), or 4.543 liters, of concentrated lemon juice contains 64 oz. avoirdupois (28.349 Gm.) of free citric acid, and 1 gallon of concentrated bergamot juice 48 oz. Purchases are made upon the basis of the analysis, since the manufacturer may sometimes obtain a juice yielding over 65 oz. The amount of concentrated juice exported from Messina in 1888 amounted to nearly 2,500,000 kilos.

For the preparation of citric acid from the juice, calcium carbonate and sulphuric acid are required [both of which are amply available in Sicily]. It would be more natural for Sicily to export crystallized citric acid instead of lemon juice.

* Another useful work on the same subject, though less extensive, is the following: "Precetti sulla Coltivazione degli Agrumi del Prof. Ferdinando Alfonso-Spagna. 8vo, Palermo, 1869." This work afterwards appeared in a revised and enlarged edition under the title: "Trattato sulla Coltivazione degli Agrumi del Prof. Ferdinando Alfonso. 8vo, Palermo, 1875."—ED. AM. DRUGG.

A SIMPLE APPARATUS FOR TESTING SPIRIT OF NITROUS ETHER.

THE well-known gasometric methods of estimating Spiritus Ætheris Nitrosi are not generally resorted to by provincial pharmacists, owing to the fact, no doubt, that nitrometers, as a rule, find no place in their apparatus. And the process lately devised by Professor Dunstan and Mr. T. S. Dymond, though admirably simple and accurate, is hardly more practical, since the average pharmacist does not possess a burette.

Now, with a little manipulative skill, an efficient apparatus may easily be constructed as follows: Take two straight pieces of glass tubing, having ¼ inch bore and say 20 inches long. About 3 inches from the end, one of the tubes should be drawn out (by holding in a Bunsen flame) to the thickness of ¼ inch. This we will call the neck (*c*). Next draw out to a point a piece of narrow glass tubing, and make the point air-tight by fusing in a flame; while the point is moderately hot, insert it in a small piece of ordinary black (feeder) tubing (if done carefully it will adhere firmly). When cold, wet it, and insert it in the neck with a sharp three-cornered file, to indicate the proper position of the plug when working it. The tube has now to be graduated: drachms will be found most suitable for this size tubing. Hold the tube upside down and pour into it a carefully measured drachm of water, and, while taking care to hold the tube perpendicularly, scratch a mark with the file; introduce another drachm, mark as before, and so proceed to the end. The cup (B) can also be graduated, though using a measure direct saves time and trouble. The tube is now complete, and has only to be attached to the other tube by a piece of india-rubber tubing (say about three feet long), and fixed to a heavy retort stand by means of two clamps. To use the apparatus, raise the limb (E) about 6 inches, then pour in and fill up to the neck with strong brine, carefully insert the plug *so as to exclude any air*, then depress the limb (E) about 12 inches. Pour into the cup a carefully measured drachm of the sample to be tested; gently raise the plug with a spiral movement, and when all but two or three drops have run in, close the aperture, add a few drops of water, and gently run in all but one or two drops. Next gently introduce a drachm of strong solution of potassium iodide (say 10 or 12 per cent), and then let in *slowly* a drachm of dilute sulphuric acid. Carefully place the plug in its proper position, agitate briskly at intervals, and after five minutes or so adjust the liquid in the two limbs to the same level and note volume of gas produced. This is well known as Allen's process; and the above apparatus was devised with the idea that the chemist who would not go to the expense of a nitrometer would, by its very simplicity, be tempted to test his sp. æther. nit. if he had any reason for doubting its strength. Of course, strict accuracy cannot be claimed for it, but it is sufficiently accurate for testing according to the B. P. The materials for constructing it could, we venture to say, be found in every chemist's shop, while the cost would not exceed a shilling. It is extremely simple of construction, is not complicated in any way, and, when made, the process of testing a sample of sp. æther. nit. is both interesting and easy; in fact, it could be successfully performed and understood by any senior apprentice of average intelligence.—A. E. SLININ and H. STUBBINS in *Pharm. Journ.* (Sept. 7th).

Artificial "Narceine" Therapeutically Worthless.

SOME time ago a process was discovered and patented for preparing what was supposed to be true narceine (occurring naturally in opium) from narcotine, by converting the latter into methylnarcotine chloride, treating with soda and then with water. The ultimate composition agreed with that of true narceine, and also the physical properties. On the strength of this, a good deal of artificial narceine has been manufactured and put upon the market.

It is now pointed out by Roser (Liebig's *Annalen*, 254, 357) that narceine is not at all related chemically to narcotine and cannot be derived from it. Claus and Meixner have shown that it is a derivative of naphthalin. Moreover, Prof. Filehne, of Erlangen, has informed Roser that the physiological effects which have been ascribed to the artificial narceine—which should be called pseudonarceine—are chimerical, and that it has no narcotic properties whatever.

AN ELECTRICAL-CONTACT THERMOMETER.

UP to the present, an adjustable thermometer-alarm with a sealed mercury column has been a great desideratum. There is an adjustable *open-tube* thermometer, which is, however, not very accurate. And there is a closed-tube thermometer with immovable platinum points (fused in the glass), which is, of course, only serviceable for the particular temperature it is made for.

M. Stuhl, of Berlin, has now overcome the difficulty and constructed an adjustable closed-tube thermometer, which is here described.

Below the beginning of the scale of the thermometer there is a small resistance, in the shape of a knob of glass, fused into the bore of the thermometer tube (see C in Fig. 1, and the enlarged view in Fig. 2). This knob leaves a fine capillary passage for the mercury upward when it expands by heating, but causes the mercurial column to break at the contraction upon cooling, so that all the mercury above the knob will be retained there, while that below the contracted place will separate and contract into the bulb, on the same principle as is carried out in the registering clinical thermometers. Immediately below the knob, a platinum wire (forming one of the electric poles) is fused into the glass. The other wire (or pole) is fused into the bulb, and is constantly in contact with mercury.

Fig. 1. Fig. 2.

Lautenschlaeger's Electrical-Contact Thermometer.

When the thermometer is to be set for a particular temperature—assuming that the mercurial column is continuous, or has been rendered so by shaking the mercury down—it is heated in any convenient manner until the exact point on the scale (say, for instance 40° C. = 104° F.) has been reached by the mercury. It is then removed from the source of heat and allowed to cool. As it begins to cool, the mercurial thread will be ruptured at the contracted place, and the mercury below will shrink into the bulb, while the mercurial column above the knob will also shrink proportionately. If now the thermometer is heated again until the mercury above the knob again stands at 40° C., the mercury in the bulb will also again expand so as to reach the upper column terminating at the knob. Just before reaching it, it will pass and touch the wire entering at B. If the wires are connected with a battery with interposed electric bell, the latter will immediately ring. When the temperature falls, the mercurial thread will break again as before and the alarm cease. The distance between the contracted place and the entrance of the wire B is so small that it has no influence (or scarcely any) upon the exact temperature. When a different temperature is to be fixed upon, the mercurial column is reunited by shaking or swinging, and adjusted, as above described, to the new place on the scale.

This thermometer is patented, and is sold by F. & M. Lautenschlaeger, of Berlin. It may be obtained through importers of chemical apparatus.

Quick Preparation of Surgical Gauzes.

H. HELBING suggests the following mode of preparing surgical gauzes at short notice:

Good raw material is of the first importance in preparing gauzes. This should be perfectly free from fat, should have at least thirty threads each way in a square inch, and should weigh about 10 drachms to the square yard. This is about the average for good stuff, though if we examine the various gauzes on the market we shall find that only the very best houses furnish a material of this standard. I have myself examined a number of samples and give a few of the figures:

Samples.	Weight of square yard.	Number of threads per square inch.
1	12 drachms.	44 × 44
2	10 "	31 × 31
3	7 "	15 × 15
4	6 "	17 × 17
5	5½ "	26 × 26
6	5 "	27 × 17

Gauze is sold here by measure, an entirely wrong principle, as, unless the buyer knows the weight and the number of threads, he cannot tell what he gets for his money. Supposing the samples I have given you were all made into 10 per cent iodoform gauze. Nos. 1 and 2, as you will readily understand, would contain nearly double the amount of iodoform in each square yard of any of the others, and if when finished they were charged at double the rate of the others it would only be a fair price. This shows how important it is when procuring such articles to ascertain the weight of the gauze and the number of threads. Of course the gauze should also be tested to see that it contains the percentage of antiseptic claimed.

Gauzes are usually kept ready by the chemist, but it may sometimes happen that a medical man may want a gauze for a case of emergency, and if the chemist have none in stock he cannot supply, as he is unable to procure it in time. In such urgent cases it is an advantage to be

able to prepare the gauze one's self, and this can be done in a few minutes by following these directions. Take the necessary quantity of raw material, and then weigh out a corresponding amount of the antiseptic.

The material is now saturated with ether or a mixture of alcohol and ether, in which the antiseptic has been dissolved, one ounce of the material requiring about three ounces of liquid. The gauze is several times wrung out and again saturated, so as to insure uniform impregnation, and for drying the gauze is now simply unfolded and shaken a few times, when it is ready for use.

In this manner all the different gauzes may be prepared—carbolic, corrosive sublimate, iodoform, thymol, eucalyptol, or any other.—*Pharm. Journ.*

Oleates.

In an elaborate paper read by G. M. Beringer, Ph.G., before the Philadelphia College of Pharmacy on the 19th of November, the author gives the following suggestions for preparing the oleates most commonly in demand, remarking that the correct specific gravity of oleic acid is 0.890 to 0.900.

Oleate of Zinc.—

Oleic Acid	1,000 grains.
Soda*	160 " (or q. s.)
Alcohol	6 fl. drachms.
Sulphate of Zinc	550 grains.
Water	a sufficient quantity.

Warm the oleic acid in a capacious vessel on the water-bath to a temperature of 140° to 150° F. (60° to 66° C.), and, having dissolved the soda in a mixture of the alcohol and 2 fl. oz. of water, add slowly the soda solution, stirring constantly until the acid is entirely neutralized, and a small portion of the resulting soap dissolved in alcohol yields but a faint pink tint on the addition of a few drops of alcoholic solution of phenolphthalein. Dissolve the resulting soap in 3 pints of warm water, and filter if necessary. Dissolve the sulphate of zinc in 1 pint of water, and filter. Warm the solution to 110° F. (43° C.), and slowly add the zinc solution to the soap solution, stirring constantly. Collect the precipitate on a moist filter, wash thoroughly with distilled water, and finally dry on bibulous paper at a temperature not exceeding 100° F. (38° C.).

The excess of sulphate of zinc ordered tends to the more ready separation of the oleate produced. By maintaining a temperature of 100° to 110° F. during precipitation, the oleate, on drying, becomes a white, friable mass which is easily powdered by rubbing through a sieve, whereas if a much lower temperature is used the resulting curdy masses are glutinous and almost impossible to pulverize. If precipitated at a higher temperature, the mass will be greasy, and will be dried and pulverized with difficulty, and give a gritty powder. As thus obtained, oleate of zinc is a nearly white, impalpable, unctuous, slippery powder, fusing at 75° C., very soluble in ether, carbon bisulphide, chloroform, and benzol, somewhat less soluble in turpentine, petroleum ether, and alcohol. The yield of this process is 1,122 gr., the difference above the theoretical yield of 1,115 gr. being most likely due to retained water.

Oleate of Copper.—

Oleic Acid	1,000 grains.
Soda	160 " (or q. s.)
Alcohol	6 fl. drachms.
Sulphate of Copper	442 grains.
Water	q. s.

Saponify the oleic acid as directed in the formula for zinc oleate, and dissolve the resulting soap in 3 pints of water. Dissolve the copper salt in 1 pint of warm water, and filter. Warm the solutions to about 140° to 150° F., and slowly add the copper solution to the oleate of soda solution, stirring constantly. Warm until the oleate of copper fuses into a mass, decant the clear liquid, wash several times with warm water, and dry on the water-bath. Yield, about 1,100 grains; theoretical yield, 1,108 grains.

Product a bright green, waxy mass, fusing at 49° C., very soluble in carbon bisulphide, chloroform, benzol, ether, turpentine, petroleum ether, absolute alcohol, alcohol, and fixed oils.

Oleate of Mercury is the oleate most frequently prescribed, and which, made according to the Pharmacopœia by dissolving the oxide in oleic acid, is a very unstable compound, the excess of oleic acid being the prime factor in its decomposition.

Oleic Acid	1,000 grains.
Potassa	220 " (or q. s.)
Red Oxide of Mercury	383 "
Nitric Acid	323 " (or q. s.)
Alcohol	6 fl. drachms.
Water	q. s.

Saponify the oleic acid with the potassa, as directed in the formula for oleate of zinc, dissolve the resulting soap in 2 pints of warm water, and filter. Mix the nitric acid with 2 fl. ounces of water, heat to boiling, and add the mercuric oxide, previously reduced to powder. Boil until it is entirely dissolved, adding, if necessary, a few additional drops of nitric acid. Dilute the solution of mercuric nitrate with 4 fl. ounces of water. Warm both solutions to 150° F. (66° C.), and add the oleate of potassium solution to the mercury solution, stirring constantly. Decant the watery solution, and wash the precipitate with warm water not exceeding 150° F. If precipitated at a much lower temperature, it will be necessary to heat the mixture to near boiling in order to form a mass of the precipitate, which heating is almost certain to result in a partial decomposition of the oleate. The same is apt to result if the solutions are mixed at a higher temperature.

The yield by the above formula was practically 1,329 grains; theoretically, 1,350 grains. It is about the color of a pale citrine ointment, and of somewhat softer consistence; fuses at 150° F. (66° C.); yields an entirely clear fluid at 70° C. It is very soluble in carbon bisulphide, chloroform, ether, and turpentine; yields an opalescent solution in benzol and petroleum ether, and is slightly soluble in absolute alcohol and alcohol.

The aqueous solution decanted from the precipitate gave no indications of mercury with solution of potassa or potassic iodide.

Oleate of Bismuth is the most difficult oleate to prepare by double decomposition:

Oxide of Bismuth dried at 212° F. (100° C.), until it ceases to lose water	1 tr. oz.
Oleic Acid	3 " " and 295 grains.
Water	q. s.

Rub the oxide of bismuth to a fine powder, and mix it thoroughly with the oleic acid in a capacious vessel. Add 2 pints of water and boil the mixture, replacing the water as it evaporates, and stirring frequently until complete saponification has taken place and a small quantity of the mass dropped in cold water yields an ointment-like mass without any separation of oleic acid. Decant the water from the oleate, and work the mass with a horn or wooden spatula to free it from retained water.

The mass is cream-colored, of ointment consistence, softens at the temperature of the body, and melts at 58° C. It is easily decomposed by contact with metals, and is but very slightly soluble in the usual solvents for oleates.—*Amer. Jour. Pharm.*

Pills and their Excipients.

The following suggestions are from a paper read by Mr. A. S. Smith before the Sheffield Pharmaceutical and Chemical Society:

Of course the simplest excipient is undoubtedly the best. For masses which contain a large proportion of vegetable powder (as in the case of pil. morph. grain ¼, which is to be made up with some inert vegetable powder), I have found nothing better than simple syrup with a few grains of pulv. tragacantha. Of course the tragacanth is to be added after the mass is made.

Glycerin, on account of its property of keeping many pills soft, is much used; it is very treacherous, however, and must not be used in masses which contain iron, as it makes such masses very brittle and crumbly.

Glycerin and tragacanth, in the form of Proctor's paste (which contains a greater proportion of water than the officinal), is very useful and makes better masses of metallic salts than syrup and tragacanth. In most other cases, however, I have got better results and in less time with syrup, etc.

For the benefit of those amongst you who have not yet tried it and would care to do so, the following is the recipe:

Pulv. Tragacanth	ʒ i.
Glycerin	ʒ iij.
Water	ʒ i.

Extract of malt is an excipient which I cannot but think has only to be better known in order to be more generally used; it has given excellent results in most masses containing iron. I have here a mass composed of ferrum redact. grains 24 and quin. sulph. grains 12. It was massed with extract of malt a fortnight ago, and is still in a good condition, a result with difficulty obtained with any other simple excipient. I have also a mass of quin. sulph. alone which was made at the same time. It is in a splendid condition and was massed with the same excipient, which is preferable to confection of roses on account of the bulkiness of the latter, and is superior to tartaric acid for therapeutic reasons. While I am speaking of extract of malt I may say I have noticed that the following B. P. pill masses, viz.: Pil. ferri carb., pil. coloc. co., pil. aloes et ferri, pil. aloes et myrrhæ, and pil. aloes et asafœtidæ, all get extremely hard after being kept some time. I have substituted extract of malt for the officinal excipient in the three following: Pil. ferri carb., pil. coloc. co., and pil. aloes et ferri. They have now been made more than a week, and I invite your attention to their present condi-

* The granular soda known as Banner lye, containing about 90 per cent of soda, was found to answer well for this purpose.

tion. I have no doubt that equally good result could be obtained in all the cases named.

Soap powder, as you all know, has its special purposes. In the case of creosote pills I have found the powdered animal soap far superior. I have here a mass made by digesting at a gentle heat, in a wide-mouthed bottle, by means of a water-bath, equal parts of animal soap and creosote until thoroughly mixed, and, after allowing to cool, massed by the addition of 1½ grains of powdered licorice to every minim of creosote. Yellow wax is much used for this mass, but is too indigestible. Bread crumb has deservedly gone out of favor for this mass.

I have found the compound decoction of aloes an excellent excipient for pills containing a large quantity of aloes; a very small quantity suffices, and it gives a splendid polish to pills, thus dispensing with powder. Incompatibility should of course be guarded against. Canada balsam makes good pills with deliquescent salts, such as potassium acetate, potassium citrate, and calcium chloride; it is also useful for benzoic acid. Pills thus made should be coated with varnish, and if meant to be kept must be kept in a stoppered bottle.

Calcii phosph. and magnes. calc. are very useful on account of their drying properties. They may be used in conjunction with cera flav. in small quantities in pills containing much oil. In using them plenty of time must be given, and magnes. calc. is very liable to make pills insoluble.

I must now leave this part of my subject, and will proceed to treat of a few substances which may occasion some little trouble when met with, and which have not been touched upon while speaking of excipients.

Butyl chloral hydrate is best managed with a thick mucilage. It may not be out of place here to say that one of the greatest drawbacks of this excipient is its acidity.

Burgundy pitch can be made into a good mass with pulv. tragacanthæ co.; it is here that the hot plate comes into requisition, by the aid of which it is easily manipulated.

Carbolic acid is not, at any rate, the most pleasant substance to make into pills; many things have been recommended, such as soap, wheat flour, marshmallow powder, etc. I have here a mass which leaves nothing to be desired, prepared according to the following formula:

℞ Carbolic Acid Crystals	grains iss.
Pulv. Glycyrrh. Decort.	grains iv.
Mucilage of Acacia	q. s.

Fiat. pil. 1.

Croton oil, owing to its small dose, can be treated with success in the same way.

Tannic and gallic acids can be massed with thick mucilage; the addition of a little glycerin to keep them soft will be found very serviceable.

Camphor makes a satisfactory mass with a small quantity of soap, say 1 grain to every 6, and massed with either simple syrup and tragacanth, or Proctor's paste if intended to be kept any time. I think the latter is preferable,—that is, if the size will permit its use.

Chloride of calcium, being so deliquescent, is exceedingly troublesome. I have here some pills containing 3 grains of that substance; they were made by the addition of half a grain of resin to each, and massed with Canada balsam. They have been varnished and have kept their shape perfectly.

Potassium permanganate is another troublesome substance to deal with. I have some pills here containing 3 grains made with the addition of half a grain of pulv. resinæ and powdered fuller's earth 1 grain, and massed with vaseline; they are much firmer than if made with ung. resinæ alone. Kaolin ointment makes a good mass, but is not always handy at the dispensing counter.

The bulkiness of most scale preparations can be greatly reduced by the addition of a few drops of water, and may be massed with pulv. tragacanthæ co. and simple syrup.

Soluble crystalline salts, such as potassium iodide and potassium bromide, must be treated with aqua destillata, in order to lose their crystalline form; they can then be massed with pulv. glycyrrh. and simple syrup with tragacanth, as in the following:

℞ Potassii Iodid	ʒ ss.
Aquæ Dest.	♏iv.
Pulv. Glycyrrh.	grains x.
Syrupi et Tragacanthæ	q. s.

Essential oils are a class upon which no fixed rule can be laid down; it is here more particularly where good judgment is of the greatest value in the choosing of an excipient. Soap is useful, but the question of incompatibility must not be overlooked.

Cera flava for colored and cera alba for colorless oils are very useful, but should be used sparingly; in fact, we would do well to remember to avoid their use where possible. Liq. potassæ, with all its drawbacks, is a very good friend in those cases where there is a superabundance of oil to be combined with an extract of resinous ingredients. A drop or two will sometimes work wonders.

I have here some pills made from the following recipe which I had to negotiate during last week:

℞ Zinci Valerian	36 grains.
Creosoti	18 "
Pil. Asafœtid. Co.	36 "
Pulv. Rhei	18 "
Pulv. Camph.	18 "

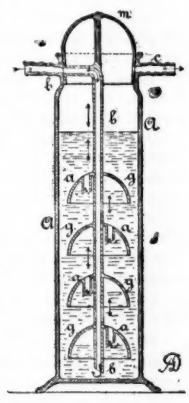
Ft. mas. divid. in pil. 36.

As will be seen, each pill contains half a minim of creosote and one grain of zinci valerian., besides the camphor, none of which are particularly nice things to manage. I took care of the creosote by mixing it with an equal quantity of pulv. saponis animalis in a warm mortar; I then rubbed down the camphor in another mortar and mixed it with the pulv. rhei and zinci valerian., after adding it to the soap and creosote, and by using an equivalent quantity of pulv. for pil. asafœtidæ co. I got a splendid mass by the final addition of half a grain of calcii phosphas.

I will conclude my remarks with a few words on those cases where a potent remedy is to be administered. An intimate mixing and perfect combination is here of the greatest importance; this end is best acquired by presenting the drug in the form of a solution. In these particular cases glycerin is especially useful; for instance, by its means hyd. bichlor. and strychnia may be first dissolved and massed with some inert vegetable powder. I think it is now generally admitted that such pills should be made up to the size of one grain.—*Pharm. Journ.*

KUEHNLENZ'S WASH BOTTLE.

For the purpose of compelling a gas to remain in prolonged contact with a wash liquid, F. A. Kuehnlenz has devised the wash bottle here illustrated. The internal tube carries four glass bells which successively catch the current of gas discharged lower down, thus insuring a more perfect washing. The inlet and outlet tubes *b* and *c* are separate pieces fused into the neck of the bottle. By a simple turn of the ground stopper *m*, these two tubes may be set out of communication and the current stopped. (Germ. Pat. 48,277).



Medicated Cotton.

The new Dutch Pharmacopœia (Pharm. Neerlandica) has a series of antiseptic cottons, as follows (after *Chem. and Drugg.*):

Styptic Cotton (with ferric chloride).—Absorbent cotton, 75; ferric chloride solution (neutral, spec. grav. 1.441–1.448), 60; rectified spirit, 75. Spread out the cotton and sprinkle it uniformly with the liquids previously mixed. Then pack in a closed bottle and leave it so for a day, until the solution has equally soaked throughout; then dry at a temperature not exceeding 40°, until the whole weighs 100 parts. The cotton contains 25 per cent of anhydrous ferric chloride. It should be kept in a closed vessel.

Sublimate Cotton.—Take 379 parts of absorbent cotton, spread it out, and sprinkle upon it a solution of 1 part of corrosive sublimate, and 20 parts of liquid paraffin in 400 parts of ether. Keep for a day in a stoppered bottle, then dry. The final weight of the cotton should be 400 parts. It contains 0.25 per cent of corrosive sublimate.

Iodine Cotton.—Ninety parts of cotton are heated to a temperature of 80° in a stoppered bottle with the stopper out, while in this 10 parts of iodine, wrapped in a piece of filtering-paper, are introduced, and the heat continued until the iodine has thoroughly impregnated the wool.

Iodoform Cotton.—Cotton, 90 parts; iodoform, 5 parts; liquid paraffin, 5 parts; ether, 90 parts. To make 100 parts of iodoform cotton in the same manner as sublimate cotton.

Phenol or Carbolic Cotton.—Absorbent cotton, 93 parts; phenol, 2 parts; liquid paraffin, 5 parts; ether, 100 parts. To be made in the same manner as iodoform cotton. Product should weigh 100 parts.

Variegated Colors for Show Bottles.—Take equal volumes of chloroform, glycerin, a mixture of one volume stronger ether and three volumes carbon disulphide, water, cotton-seed oil, and alcohol. Shake the chloroform with a little water, then separate the excess; to the chloroform thus saturated with water add a little bengal red, shake well a few minutes, and filter. In the ether and carbon disulphide dissolve a little iodine. In the alcohol dissolve a little bengal green or chlorophyll from fresh green leaves. Now pour these various colored fluids into a clear flint-glass bottle or other similar container just large enough to hold them all, beginning with the chloroform and following with each in succession down to the alcohol. They should all be added carefully down the side of the container and without agitation, and, lastly, enough more alcohol should be added to completely fill the container after the insertion of the cork. This will give a bottle with six separate layers of colored fluids, and presents a very pretty sight.—*The New Idea.*

The Preparation of Microscopical Sections from Barks and Roots used in Pharmacy.

AT a recent meeting of the London Chemists' Assistants Association, the following paper was presented by M. J. Cole:

Barks and roots that have been dried must be cut into small pieces and soaked in water for several hours; this will cause the tissues to swell up and regain, to a certain extent, their natural shape. They are then to be transferred to methylated spirit, which should be changed every twenty-four hours until no color comes away from the tissue. They will then be ready for cutting into sections, or they may remain until required.

Fresh specimens should be cut into small pieces and placed in methylated spirit, which should be changed until no color is given off from the tissue. The hardening will usually be complete in a week, or they may remain for any length of time until required for cutting.

Some barks will be found too hard to cut; they may be softened by soaking for a time in liquor potassæ, then wash well in water until all trace of potash is removed.

Section-cutting.—Fairly good sections may be made by hand with an ordinary razor. Hold the piece of tissue in the left hand, keeping the forefinger straight so that it may form a rest for the blade of the razor to slide on. A good strong army razor answers very well. Hold it firmly in the hand and keep the handle in a line with the blade, and draw it from heel to tip through the tissue towards yourself. Keep the blade well wetted with dilute methylated spirit, and as the sections are cut place them in a saucer of spirit or water.

Section-cutting with a Microtome.—If really good sections are required, a microtome of some kind should be employed. A very good and complete instrument, capable of being used for making all kinds of microscopical sections, can be obtained from Messrs. W. Watson & Sons, of 313 High Holborn. Screw the microtome to a firm table, and, with the tube supplied with the machine, punch out a cylinder of carrot to fit the well of the microtome. Cut this in half longitudinally, and scoop out sufficient space in one half to take the tissue to be cut. Put the other half of carrot in its place, and make sure that the tissue is held quite firmly, but it must not be crushed. Now place the whole in the well of the microtome and commence to cut the sections with a strong razor, or the section knife that is supplied with the machine. When desired, keep the blade of the knife well wetted with dilute spirit, and as the sections are cut place them in a saucer of spirit or water.

Bleaching. — Vegetable sections generally require bleaching before they can be properly stained. A solution of chlorinated soda is usually used. Soak the sections in distilled water to remove the alcohol. Pour off the water and add a quantity of the bleaching solution, and allow it to act for from three to twelve hours, or until all color has disappeared from the sections, then transfer to water, which must be changed several times until all trace of soda is removed.

Staining Sections.—The best staining fluid for general purposes is logwood. Take 2 ounces of ground logwood chips, place them in a calico bag, and run water through it until scarcely any color comes away. Drain away as much water as possible, remove the logwood from the bag and spread it in a thin layer on a tray to dry. Dissolve 2 drachms of potash alum in 12 ounces of distilled water. Put the logwood into a vessel, pour on the alum solution, and let it stand for forty-eight hours. Strain through muslin, and add 4 ounces of glycerin and 1 ounce of rectified spirit, mix well together, filter through paper, and add a small lump of camphor to make the mixture keep. Place the section in distilled water.

Add from 30 to 40 drops of the logwood solution to an ounce of distilled water, filter, and immerse the section for three or four hours. Wash well in distilled water and then soak for a short time in ordinary tap water to fix the color.

Transfer to methylated spirit for ten to fifteen minutes to dehydrate.

Take a small saucer or watch-glass full of clove oil and carefully float the section on to the surface of the oil and let it soak for five or ten minutes. When quite clear, wash in turpentine and mount in Canada balsam.

The logwood solution may be used undiluted for quick staining, but better results are obtained by the slower process.

Mounting in Canada Balsam.—Take 4 ounces of dried Canada balsam and dissolve in 4 fluidounces of benzol, filter, and keep in a good outside-capped bottle.

Clean a slide, place some balsam on its centre, take the section from the turpentine with a lifter, and place it in the balsam on the slide. Now clean a cover glass, and with a pair of forceps bring its edge in contact with the balsam on the slide; ease it down carefully so that no air bubbles may be enclosed, and press down until the section lies quite flat. Now put the slide away for a day or two so that the balsam may set, and then take a soft brush and with some benzol wash away the exuded balsam from around the edge of the cover. Allow the slide to dry and apply a good coat of gold size, and when this has dried wash the slide with some soap and water, dry well with a soft cloth, and add a coat of asphalt.

Double Staining.—

Aniline Acid Green Stain.

Acid Green	2 grains.
Distilled Water	3 ounces.
Glycerin	1 ounce.

Mix the water and glycerin well together and dissolve the green in the mixture.

Carmine Stain.

A.

Borax	10 grains.
Distilled Water	1 ounce.
Glycerin	½ ounce.
Alcohol	½ ounce.

Dissolve the borax in the water and add the glycerin and alcohol.

B.

Carmine	10 grains.
Liq. Ammonia	20 minims.
Distilled Water	30 minims.

Dissolve the carmine in the ammonia, in a test tube, with the aid of heat if necessary, and add the water. Mix A and B together and filter.

Place the section in the green stain for five to ten minutes. Wash well in distilled water. Place in carmine stain for ten to fifteen minutes, wash in methylated spirit, in which the section must remain for at least ten minutes. Clear in clove oil and mount in C. balsam.

Mounting Sections in Glycerin Jelly.—Place the section in distilled water and soak until all trace of alcohol is removed. Warm the jelly and place a few drops on the centre of a clear slide, and put the section in it. Clean a cover glass and apply it in the same way as directed for balsam. Allow the slide to cool, and then the exuded jelly may be scraped away with a penknife and the slide washed with water. Dry well with a soft rag and apply a coat of gold size, and when this has dried add another of asphalt.—*Pharm. Journ.*, December 21st.

The Borax Lake and Industry in California.

AT a recent meeting of the Society of Chemical Industry, Mr. C. Napier Hake read the following paper:

The history of the discovery of borax and borates in Nevada may be briefly summed up as follows:

In 1864, some borate of lime in the form of cotton balls (ulexite) was found in Columbus Marsh, but no particular notice was taken of this discovery beyond sending specimens to Washington, where they found a place in the cabinet of the National Museum. Between 1869 and 1871, a systematic search was made which resulted in the rediscovery of the deposits in Columbus Marsh, and other deposits of ulexite near salt wells. These deposits were worked for a short time only. In 1873, the deposits known as Borax Lake and Teel's Marsh were discovered. The former lies in the Mojave Desert, the latter in Nevada. Both deposits are very extensive. A little later a third deposit was discovered near Dagget, consisting of borate of lime (colemanite).

Situation of Borax Lake.—The Borax Lake is situated in the extreme northwest corner of San Bernardino County, and is 450 miles distant from San Francisco in a southeasterly direction.

Mojave station, on the Atlantic and Pacific Railway the nearest point of shipment, is connected with the lake by a good wagon road 72 miles in length.

The lake lies in the valley of the Slate Range and Argus Mountains, at an elevation of 1,700 feet above the sea. It is oval in shape, and its greatest length and breadth is 12 miles by 8 miles. The greater part of it is covered with a hard saline incrustation, varying in thickness from a few inches to several feet. The surface is covered with white efflorescent matter largely mixed with sand. Under the hard crust, the lake consists of one vast bed of black mud containing a large proportion of iron sulphide saturated with saline matter and strongly impregnated with sulphuretted hydrogen gas. The thickness of this mud-bed has not been determined.

In the lake are contained common salt, carbonate of soda, hydrated and anhydrous bicarbonate of soda, biborate of soda, sulphate of soda, hydrated and anhydrous sulphate of magnesia, salts of ammonia, and traces of bromine and potash. Although I made a diligent search, during the four weeks I remained on the lake, I was unable to detect a trace of iodine. A new and highly interesting mineral has been discovered in the mud of this lake in small hexagonal crystals, to which the name of "hanksite" has been given, after Professor Hanks, of San Francisco, whose name is so honorably connected with the mineral devel-

opment of California. Its composition is expressed in the formula: $4Na_2SO_4,Na_2CO_3$.

The lake may be for all practical purposes divided into three sections, each section representing well-defined deposits of—

(1) Biborate of soda;
(2) Bicarbonate of soda; and
(3) Common salt.

The borax occupies the northern portion of the lake. A very pure deposit of bicarbonate of soda lies on the northeastern shore. The remaining surface deposits consist chiefly of common salt, which becomes purer towards the southern extremity of the lake.

The common salt and bicarbonate of soda deposits have at present no commercial value. The latter is, however, of considerable interest as an example of the ammonia-soda process being carried on by nature. All the ingredients necessary for this process are contained in the waters underlying the deposit, viz., ammonia, carbonic acid, and common salt. The deposit is from 6 inches to 18 inches thick, and in many places almost chemically pure.

Crystal Beds.—Near the centre of the borax section, which is the lowest level of the lake, there exists a patch covering an area of about 300 acres, which is nearly always covered with water to a depth of from one inch to a foot. This patch is called "the crystal bed," from the fact that the mud underlying the water is full of large crystals. These crystals are not deposited regularly, but form nests several feet in thickness and penetrating 3 or 4 feet downward.

The spaces intervening between these nests are filled up with mud, and are comparatively free from crystalline deposit. By damming off the water I was enabled to make an examination of some of these nests. The crystals thrown out consisted of carbonate of soda and common salt, with a large proportion of borax, some of the crystals of which measured as much as 7 inches. During one exceptionally dry season, when the water was low, about 700 tons of borax were refined from this source.

The underlying water, at a depth of 15 feet, contains carbonate of soda, chloride of sodium, sulphate of soda, borax, and salts of ammonia.

The ground around this crystal bed consists of a dry, hard crust about 1 foot thick. This crust contains carbonate and sulphate of soda and about 1 per cent of borax. On this hard crust there is, again, another deposit of efflorescent matter, containing about—

Sand	50 per cent.
Sulphate of Soda	16 "
Common Salt	12 "
Carbonate of Soda	10 "
Borax	12 "

This surface deposit represents the chief source of raw material for the manufacture of refined borax.

The deposit is worked in the following manner:

Method of Working Deposit.—When the crude efflorescent surface has accumulated to a depth of about 1 inch in thickness, it is loosened by means of a shovel and swept into windrows, space being left between each windrow to allow of the passage of a cart.

The surface thus cleared of its salts begins to renew its coating. The moisture, as it creeps upwards, is evaporated by the heat of the sun, leaving the solid matter, which is held in solution on the surface. This action is allowed to go on for three or four years before the surface is again disturbed. In order to get some idea as to the proportionate growth of the different salts contained in this efflorescent matter, I took samples representing six months' growth, two years' growth, three years' growth, and four years' growth. From all the sections from which these samples were taken the surface has been removed three or four times within the last twelve years, and in most places marks of the old windrows were visible.

Analyses of Crude Borax Material from Dry Lake:

	6 Months' Growth.	2 Years' Growth.	3 Years' Growth.	4 Years' Growth.
Sand	58.0	55.4	52.4	53.3
Carbonate of Soda	5.2	5.0	8.1	8.0
Sulphate of Soda	11.7	6.7	16.6	16.0
Chloride of Soda	10.9	20.0	11.1	11.8
Borax	14.2	12.9	11.8	10.9
	100.0	100.0	100.0	100.0

The analyses show that the first six months' growth is richest in borax, and that the proportion of carbonate of soda to borax appears to increase regularly. The presence of sand in such large quantities is due to the high westerly winds which blow periodically and drive it from the mountain slopes across the lake. This sand, no doubt, facilitates the formation of the surface deposit by keeping the ground in a porous condition.

That only this section of the lake produces borax to any extent is due, no doubt, to its low level. The hard crust above mentioned dips in the water, which rises by capillary attraction. This contact appears to be a favorable if not a necessary condition, for during very dry seasons, when the level of the water is low, surface recuperation goes on very slowly or even ceases entirely.

Process of Manufacture.—The factory, which is situated on the northwest corner of the lake, consists of a dissolving house, raised about 20 feet above the level of the ground, concentration house, a refining house, and boiler house. The process by which the borax is extracted from the crude material is very simple, and comprises two operations, viz., dissolving and allowing the solution to crystallize.

The crude material is transported by means of carts from the lake to the works, and is passed through a mill previous to its being thrown into the dissolving pan, in which is contained a boiling saline solution, preferably mother-liquor from the second crystallization. The solution is kept boiling by high-pressure open steam as the crude material is being shovelled into it, during which operation free ammonia is copiously given off. The salts dissolve entirely, leaving the insoluble residue, chiefly sand, at the bottom of the pan. The hot solution, after standing for some time in order to clarify, is run off into crystallizing pans and allowed to cool for from five to nine days, according to the season of the year.

The product of this first crystallization is a mixture of octahedral and prismatic borax, slightly impure and somewhat colored by organic matter. This product is either sold as "concentrations," or redissolved in boiling mother-liquor and the resulting solution allowed to cool to 120° F. From this solution refined borax of excellent quality is obtained. The works are capable of turning out over 100 tons per month, about fifty men and sixty-five animals being employed. The factory is exceedingly well arranged and substantially built, and under careful and intelligent management.

During the time of my visit at the lake the fuel used on the works was the sage brush, the only wood growth in this desert. The difficulties of collecting this material were enormous. Carts were sent out scouring the country for ten miles round in search of fuel, and remained away often for a week at a time. This difficulty has been partially met by substituting crude petroleum, which has to be carted seventy-two miles across the desert. The results, however, I am told, show a saving of nearly 40 per cent as against the sage brush, besides other advantages, such as greater regularity of working.

Water Supply.—The question of water supply is an extremely interesting one. The water is obtained from two sources. The one which is used for drinking purposes and for feeding the boilers is brought in iron pipes from a cañon lying in the Argus range, 7½ miles distant from the works, at an elevation of nearly 300 feet. This cañon, which forms an oasis in the desert, contains several springs, and where cultivated yields an abundance of fruit and vegetables.

The other supply is drawn from artesian wells which are sunk to a depth of 55 feet on the shores of the lake. The water rises from 3 to 10 feet above the surface, and the flow is constant and regular.

This water is strongly alkaline, containing about 1 per cent of carbonate of soda, strong traces of borax, and salts of ammonia equal to about 18 grains per gallon.

Labor.—The question of labor presents no difficulties; all common operations are carried on by Chinamen, and this class of labor can be procured in California at a comparatively moderate rate.

Transport.—The refined borax is packed in casks and transported to Mojave in the so-called "desert schooner," a strongly built wagon drawn by 20 mules. The average load is 10 tons, and the trip to Mojave and back takes eight days. The road through the light sandy soil of the desert rises gradually 1,000 feet during the first 25 miles.

This road is controlled by the owners of the lake, who possess the right to the water, which is supplied to the four roadside stations through iron pipes from a range of mountains 10 miles distant. These stations afford sleeping accommodation for the teamsters and stabling for the animals.

During my visit to California I took every opportunity of making myself acquainted with the extent and value of the borax deposits in the Pacific States, and I gathered that, though widely distributed, there are only three deposits of any great importance which are actually being worked at the present time. These deposits yield from 1,500 to 2,000 tons of borax annually, nearly the whole of which is consumed in the United States.

The lake which I have described has been regularly worked for the last fifteen years under the direction of Mr. J. Searle, the chief owner, who is known all over California as the keenest bear hunter in the State; but he is not less known for his hospitality, high integrity, and intelligence. During this period it has supplied about one-third of the total amount derived from similar sources, and with considerable profit to the owners. The supply of borax on this lake appears to be practically inexhaustible, and it only requires improved means of transport for its full development.

In conclusion, it may be of interest to briefly allude to Death Valley, which lies 400 feet below the level of the

sea. Borax and borate of lime deposits have been discovered and worked in this valley, which is probably the most desolate and least explored of any portion of the United States. The climate, owing to the intense heat and dryness of the atmosphere, is almost unbearable. It is absolutely devoid of either animal or vegetable life. During several months in the year work has to be suspended, one reason being that the solution would not cool down to a temperature at which crystallization takes place.

Saccharin in Belgium.

SOME time ago a heavy import duty of 140 francs per kilogramme, practically amounting to prohibition, was placed upon saccharin in Belgium, in the supposed interest of the sugar industry. It is now discovered, however, that this law is quite inoperative, the consumption of the sweetener being noticeably on the increase and the article being freely obtainable from a number of dealers, while yet not a single ounce has passed the custom-houses since the promulgation of the new law, and no instances of smuggling have been traced. The explanation is now given that in the preparation of commercial saccharin the process is one of seven distinct stages. The product of the sixth stage is quite different from saccharin in physical and chemical properties, and to it, consequently, the duty cannot be applied. In this state it is imported into Belgium, and across its frontier it is subjected to the final process—a simple treatment with an acid, which converts it into the commercial article.—*Chem. and Drugg.*

The Source of Pumice Stone.

THE supply of pumice stone used in the arts is at present derived mainly from the island of Lipari, in the Tyrrhenian sea. The island is of no general interest, and is scarcely visited at all by any but Italians engaged in trading in its productions, such as currants, capers, wine, and pumice. It is mountainous in character, and consists of tufas and lavas, and of highly siliceous volcanic products. The district where the stone is found is called Campo Bianco or Monte Petalo (1,500 feet above the level of the sea). It is an interesting ride there upward from the town. The views obtained of land and sea during the ascent are very fine, and the effect produced by the first sight of the pumice deposit is curious, for after riding a considerable distance, partly along precipitous paths sufficiently dangerous to be interesting, and partly through vineyards and over grassy plains, one almost suddenly comes upon a seemingly snow-clad, narrow valley, enclosed by hills also quite white, and the whole glaringly bright on a sunny day such as can be experienced in this southern latitude. Into these hills workmen are ceaselessly digging deep burrows, working within by candle-light. In their excavations they come across many lumps of pumice stone, which are placed in baskets, subsequently being conveyed along the valley to the seashore, where small boats are loaded and sailed to the seaport near by, where the stone is sorted, packed, and shipped to distant parts either *via* Messina or Leghorn. Some years ago it was almost the general custom to send the stone loose in the vessel to the Leghorn merchants, who sorted and packed it for shipment. This custom, however, has been altered, and by getting the stone sorted at the place of production far better results have been obtained than formerly. There is no doubt but there is now less good stone to be found than used to be the case. For one ton of good light stone a miner has to have many tons of inferior quality to dispose of, and now that prices have been so interfered with by the operations of the syndicate that has been formed to acquire the working of the principal portion of the mines from the municipality, it has become a question of paying a very high price for stone we could formerly obtain for far less than it now costs.—*Chem. and Drugg.*

Piuri, or Indian Yellow.

THE following information regarding the curious East Indian dye stuff known as *piuri*, or Indian yellow, was furnished, upon the request of Prof. Graebe, of Berlin, by the India Office, on the basis of inquiries made by T. N. Mukharji in 1883 (*Journ. Soc. of Arts*, v., 32, p. 16), but seems to have remained almost entirely unknown.

Piuri is produced in Monghyr (or Mungir, chief town of a district in Bengal, between 24° 22′ and 25° 49′ N. L., and between 85° 40′ and 86° 55′ E.) from the urine of cows fed upon mango leaves. Mukharji ascertained that the only producers of the dye stuff are a sect of gwalas ("milkmen") who dwell in the suburb upon a place called Mirzapur. These people feed their cows exclusively upon mango leaves and water, which causes an increase of biliary constituents in the urine, and imparts to the latter a fine yellow color. It is asserted that the cows fed in this manner die after two years, but the piuri-makers declare this to be an untruth. Mukharji himself saw cows of six to seven years of age who had yielded piuri during four years. But these cows had a very sickly look, and the owners stated that they had to be fed occasionally upon grass and other fodder besides mango leaves, but that mixed fodder diminishes the quantity of piuri in the urine. In consequence of the injurious effects of the mango-feeding upon the cows (the cow is a sacred animal to the Brahmanical sect of the Hindus), the piuri manufacture is confined to but few persons, and these are despised by the members of the caste.

The cows thus fed on mango leaves have the external urinary organs rubbed three or four times daily with the hand, which alone enables them to pass urine. The urine is collected during the day in small earthenware pots, and is transferred every evening into an earthen vessel, which is heated over a fire. The heat causes the separation of the yellow coloring matter. It is pressed through a piece of cloth, and the pressed matter formed to a ball, which is dried first at a charcoal fire and then by exposure to the sun. It is now ready for sale. The merchants (chiefly Marwaries), who make advances to the makers, buy the piuri at 1 rupee per pound, and take it to Calcutta and Patua. A cow usually produces 3 quarts of urine per day, which yield about 2 oz. of piuri. The yearly production is estimated at 10,000 to 16,000 lbs., which appears too high a figure.

The chemical composition of piuri was studied some years ago by Stenhouse and Erdmann, and recently again by Prof. Graebe. It was found to contain: euxanthic acid, 33 to 72 (mean 51) per cent; euxanthon, 0 to 34 per cent; silica and alumina, about 1.5 per cent; magnesium 4.2, calcium 3.4 per cent; together with water and volatile substances.—After *Liebig's Annal.*

Improvement in "Black Wash" and "Lead and Opium Wash."

F. C. HENDERSON communicated to the Dundee (Scotland) Chemists' Association the following: A change of mercurous into mercuric oxide in the lotio hydrarg. nigr., which has sometimes been remarked, he had found to be prevented in the following formula:

Calomel	℥ i.
Glycerin	fl. ℥ i.
Lime Water	q. s.

Rub the calomel with the glycerin in a mortar; transfer the mixture to a bottle; add 4 oz. of lime water, and shake well; then add sufficient lime water to make 1 pint. Where this lotion is in frequent demand the calomel and glycerin may be kept ready mixed and the lime water added as required.

Made by the customary formulæ the lotion of lead and opium presents a muddy appearance, and rapidly coats the sides of the container with a thick deposit. He therefore recommends the following:

Solution of Subacetate of Lead,	
Glycerin,	
Tincture of Opium	ää fl. ℥ i.
Water	q. s.

Dilute the tincture of opium with 15 to 16 oz. of the water; mix the glycerin with the solution of subacetate of lead and add to the opium solution, and finally add enough water to make 20 oz. The product is a clear mixture which does not separate.—*B. and Col. Drug.*

Preparation of Strong Alcohol without Distillation.

THE following novel method has been devised by Conrad Schmitt for obtaining alcohol of a high percentage without distillation. While it is not likely that the method will be practically used where it is possible to employ the process of distillation, yet there may be special circumstances when distillation is impossible or undesirable, and in such cases the method may be followed, though the product will probably be suitable only for technical uses.

Assuming that a 30 per cent alcohol is available, this is first mixed with a quantity of potassa, to cause a homogeneous solution just short of separating into two layers. The solution is now shaken with petroleum ether, which extracts all fusel oil from the alcohol. For every 300 C.c. of 30 per cent alcohol (that is, for every 90 C.c. of pure alcohol), 600 C.c. of petroleum ether should be used. After the separation of the petroleum ether, a further quantity of potassa is added to the alcohol, so as to cause a separation into layers, the upper one consisting of alcohol of 94 per cent. This is separated, the small amount of potassium carbonate contained therein is neutralized with sulphuric acid, the potassium sulphate separated, and the remaining liquid decanted. This is said by the author to be pure 94 per cent alcohol.

The petroleum ether containing the fusel oil in solution is first washed with cold water, which deprives it of any alcohol it has dissolved, then with water at 50°–60° C., which takes out the fusel oil, and finally with alcohol at 50°–60° C., which removes aromatic compounds. The latter are used for compounding artificial liquors, and the petroleum ether may be used over again for purifying fresh portions of crude alcohol.—*Chem. Centralbl.*

A NEW METHOD OF DETERMINING THE MELTING POINT OF FATS.

THE determination of the melting point of fats is accompanied by many difficulties and uncertainties, chiefly owing to the almost unavoidable sources of error during the experiment. A simple inspection of the various melting points assigned by different authorities to one and the same fat will prove this. Among the methods heretofore recommended and used, the following may be mentioned here:

Bach warms the fat in a beaker and stirs it with a thermometer. As soon as the whole mass is clear, the temperature is read off (*Pharm. Centralh.*, 1883, 159).

Wimmel places a small glass tube, containing a globule of the fat, vertically in a beaker full of water, warms the latter, and notes the moment when the globule of fat is pushed upward by the water (*Pogg. Annalen*, 133, 792).

The Society of Bavarian Chemists directs to heat a capillary tube, containing the fat and sealed, in a bath of glycerin until the fat is completely transparent (Hilger, "Vereinbarungen," etc., 1885, 222).

Pohl applies the fat to the bulb of the thermometer, introduces the latter in water, warms, and notes the temperature at which the fat becomes detached and rises (*Polyt. Notizbl.*, 1855, 165).

Zaloziecki directs to introduce a little of the fat into a glass tube closed at the other end, and to pierce the globule of fat with a needle in the direction of the bore of the tube. On warming, when the fat melts, the channel made by the needle is stopped, and the expanding warm air below the globule pushes the latter out of the tube (*Chem. Zeit.*, 1888, 788).

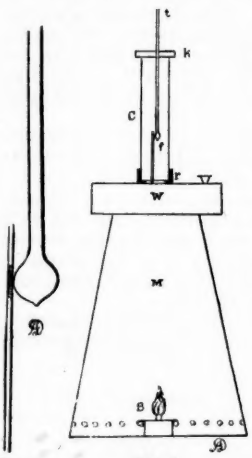


FIG. 1. FIG. 2.

Similar methods have been proposed by Guichard, Gross, and Beran. Damien recommends to use a disc of the fat, and to arrange it so that one side of the disc just melts while the other still remains solid (*Compt. Rend.*, 108, 1159). But this requires a too complicated apparatus.

B. Kohlmann, of Leipzig, from whose paper on this subject (in *Archiv d. Pharm.*, 1889, 828) this abstract is taken, has endeavored to avoid the usual errors inherent in the ordinary determinations of melting points. His method is based on the assumption that the melting point of a fat is not that temperature at which it possesses its greatest transparency (see *Zeitsch. f. anal. Chem.*, 1886, part 1), but that at which its several particles lose their cohesion sufficiently to part under a gentle pressure. This being assumed, it is only necessary to determine the exact temperature at which this occurs. This may be done in the following manner.

Supposing we had a vertically placed glass tube filled with the previously melted and then solidified fat, closed below but open above, and we were to place upon the column of fat a heavy body of such diameter as to slide easily up and down the tube. On applying a gentle heat, the fat contained near the bottom of the tube would melt first, the liquefaction would gradually extend upward, and finally the portion of fat still supporting the heavy body would melt, causing the latter to sink. This is the moment at which the temperature is to be taken.

In practice the experiment is performed as follows:

A capillary tube of very thin glass, about 1 Mm. in bore and 2½ to 3 inches long, is filled with the fat (by suction), then put into a horizontal position, and into one end a little piece of platinum wire introduced, about 1 to 2 Mm. in length and about 0.5 Mm. in thickness, so that it just enters the column of fat. The other end of the tube is closed, after cooling.

The tube thus prepared is placed into a warm-air bath in such a manner that the point where the platinum wire is situated is in contact with the broadest part of the bulb of the thermometer. It must be remembered that the first effect of heat is to cause the column of fat to expand somewhat, whereby the platinum wire is somewhat pushed upward. Everything having been arranged (see Fig. 2), heat is applied, and as the temperature gradually increases the fat will melt in the lower part of the tube, gradually melting upward until the piece of wire is nearly reached. At this point care must be taken to observe the thermometer, and to read off the latter at the moment when the wire sinks through the fat.

The warm-air bath recommended by the author consists of a base of tinned iron, M, upon which rests a receptacle for water, W, containing in its centre a frame, *r*, into which the glass cylinder C may be inserted. This cylinder is closed by a disc, *k*, through which passes the thermometer, and *f* is the capillary tube. A little alcohol lamp is used for heating.

Rapid Estimation of Fat in Milk.

A. W. STOKES has devised a modification of Dr. Werner Schmid's method of rapidly determining fat in milk, which permits many samples to be examined in a short time. The method is as follows:

Into special tubes (to be obtained of Messrs. Townson & Mercer, of London), which are partly graduated up to 50 C.c., transfer 10 C.c. of the milk, if fresh, and then pour direct from its bottle some hydrochloric acid roughly to the 20 C.c. mark. If the milk is a sour sample, weigh out 10 Gm., and, with a small wash bottle containing strong HCl, wash the milk into the tube till it is full to the 20 C.c. mark, about. Now boil the mixture with frequent shaking till it turns brown. Merely heating it to the boiling point of water, by immersion in a water-bath is not sufficient. Leave for about three minutes to stand; the color will darken considerably, while thus standing, without further heat. Cool by immersion in water; fill up roughly to about the 50 C.c. mark with ether. It is not necessary that the ether should have been previously washed with water unless it contains more than 3 per cent of alcohol. Cork the tube and shake the mixture for half a minute; let settle for five minutes. Accurately pipette off 20 C.c. of the supernatant ethereal solution into a tared dish, evaporate off the ether, dry in an air-bath, and weigh the residual fat. It is advisable to take at least 20 C.c. of the ethereal solution, so as to avoid the errors of high multiplication. It is perfectly easy to pipette off accurately 20 C.c. of the ethereal solution; the presence of fat in the ether prevents the difficulty that is found in pipetting off ordinary ether. Now notice how many C.c. of ethereal solution are left in the tube. Here there is sometimes a slight difficulty, since above the sharp line that separates the brown mixture of HCl and milk from the colorless ethereal solution there sometimes floats a fluffy, narrow stratum of casein. If, however, three-quarters of this stratum be assumed to be ether, a correct reading will be made. From the whole quantity of ethereal solution originally present the percentage of fat in the milk is now calculated.

The whole process, doing at the same time a number of samples, need not take more than twenty minutes. Its accuracy is not excelled by any other process; the process is simple; the reagents are those found in every laboratory; almost all the ether and the HCl can be recovered if thought worth while; the only special apparatus needed is a cheap calibrated test tube.

The HCl and the milk in the process should not be boiled together more than two minutes, else the ether will take up a caramel-like substance. Very highly watered milks do not turn a dark brown because of the small amount of milk sugar present, while condensed and sugared milks become almost black.

An example may show the calculation required.

Ten C.c. of a milk having the spec. grav. 1.031 and giving 12 per cent by weight of total solids, when treated thus, gave, in 20 C.c. of ethereal solution, 0.277 Gm. of fat. There were left in the tube 6.5 C.c. of ethereal solution, making a total of 26.5 C.c. Then

$$\frac{0.277 \times 26.5}{2}$$

= 3.67 per cent in 100 C.c. of the milk. Dividing this by the spec. grav. 1.031, we get 3.55 per cent by weight of fat in the sample. Calculating from the spec. grav. and total solids, the fat should be 3.54 per cent.—After *Chemical News* (November 1st).

Milk Analysis.

IN the discussion of the relative merits of the different methods of milk analysis which was published in the *Analyst*, the many advantages of a simple modification of Wanklyn's method does not, I think, receive its due consideration. This modification, which I have adopted, I have already published in my annual report as milk inspector for the city of Boston, Mass., 1885, and as analyst to the Massachusetts State Board of Health in their annual report for 1886, page 138. As being now the method generally followed by most of the official milk analysts in New England, a simple description of it may be of interest to others.

The 5 Gm. of milk are weighed off in a large flat-bottom platinum capsule of full 2½ inches diameter on the bottom and about 3 inches across the top. The ¼-inch high side turns up from the bottom, not with a sharp angle, but slightly rounding, this being about the curve with which the milk runs up the rim of the capsule, drawn by capillarity. The milk in drying down does not thus form any thicker deposit at the angle of the side than elsewhere upon the about five square inches of bottom surface of the capsule. This relatively large amount of surface, one square inch to each Gm. of sample taken, causes each inch to be covered with only a little over a single grain of dried milk solids. The deposit is, therefore, so very thin as to be readily exhausted of its fat in its subsequent treatment with boiling petroleum naphtha. When using such small dishes as were originally proposed by Wanklyn, the residue would be so thick—that is, about three times—

as would naturally render any such rapid method of extraction as I employ impossible, as the English analysts have learned. Each capsule has its serial number engraved upon it, and they are made to weigh a little over 25 Gm. each, that the bottom may be stiff enough to remain perfectly flat—a matter of very great importance. They are also made to differ from each other only in the second and third places of decimals, so that only those weights have to be changed in many weighings, which is a matter of no little saving of labor where many score of weighings are to be made each day. A table of their weights is kept within the case of the scales. The capsules containing their samples are placed upon a constant-level, closed-top water-bath of the peculiar construction described on page 269 of the current volume of the *Journal of Analytical Chemistry*. This will hold 25 capsules at a time. Here, being surrounded by an atmosphere not already nearly saturated with moisture, as would be the case if they were upon a water-bath with openings on its top, they quickly evaporate to apparent dryness. They are then transferred, for their final drying to a constant weight, to one of Weisnegg's large porcelain-lined air-baths, regulated to the constant temperature of 105° C. Here they are dried in about half an hour, when they are cooled in a desiccator and each weighed immediately upon being taken out, to guard against their rapid gain in weight from exposure to the air. Replaced upon the closed-top water-bath, the capsule is filled from a wash bottle with petroleum naphtha of the quality of the benzin of the U. S. Pharmacopœia, revision of 1880. This, unlike ether, will dissolve out neither milk-sugar nor lactic acid from the dried milk-solid residue. Moreover, 1 gallon of it costs but as much as 1 pint of ether would, which is a matter of some little consequence to one like me, who has had to use about 100 gallons of it in milk analyses during the past five years.

The naphtha in the capsule, after being allowed to boil down about one-half, is decanted off against a rod into a basin to guard against the remote possibility of some flakes of milk residue being poured off with it. Replaced upon the bath, the capsule is refilled with naphtha. This boiling-up and decanting-off is repeated three to four times, when, after the last one, the outside of the capsule is washed off with naphtha played upon it from the wash bottle, to prevent any residue of fat being left there. The capsule, then finally replaced upon the bath to dry off the naphtha, is then cooled and weighed as before, the butter being rather determined from the loss of weight in the solids than by the weight of the evaporated washings.

The ash is made by the ignition of the capsule over a one-inch wide Bunsen lamp, which thus gives so wide a flame as not to require a heating to a high temperature at one point, and thus a possible loss by the volatilization of the potassium chloride. The milk sugar I determine by the use of a Soleil-Ventzke saccharimeter in the same manner as has now been several times described in the journals by Drs. Wiley, Vieth, and others. The other ingredients which reduce copper in Fehling's solution are not thus reckoned as sugar, by which the apparent amount of albuminoids present, which are obtained by difference, would be diminished.

The peculiarity of my modification is, then, the use of an evaporating capsule of such a very large relative area as will leave the residue thin enough to be readily exhausted by the boiling naphtha. This a diameter of 2½ inches in the capsule will do for 5 Gm. of better than average quality of milk, with a surety that there will not be as much as one-tenth of one per cent of fat left as a maximum error. And surely this is fine enough for all commercial work, and it is much to be doubted if much which affects to be more accurate by a decimal than this is really so. The method, as involving no transfer of substance, cannot well be made more simple for the determination of total solids, fat and ash. When the average life of such an evaporating capsule under reasonable usage is considered, it cannot well be cheapened, although the outlay for a kilo of platinum for 40 capsules like mine does, it is true, involve an original expense of nearly $400. The shape of my capsules makes possible completeness of extraction with the solvent used, and the construction of the closed water-bath hastens the process in no small degree.—Dr. Bennett F. Davenport in *Jour. Anal. Chem.*, iii., 309.

The Unification of Nomenclature in Organic Chemistry.

The following is the text of the resolutions adopted at the International Chemical Congress recently held in Paris:

Nomenclature of the non-saturated derivatives of the fatty series.—"The letters *a* and *b* shall designate the two atoms of carbon bound together by multiple bonds in the case of bi-substituted derivatives; in the case of tri-substituted derivatives the designation may be omitted, provided the two radicals united to the same atom of carbon be named first."

For instance, the compounds

$$\begin{matrix}CH_3\\H\end{matrix}\!\!>\!C=\overset{a}{C}\!<\!\!\begin{matrix}C_2H_5\\H\end{matrix} \quad \text{and} \quad \begin{matrix}CH_3\\C_2H_5\end{matrix}\!\!>\!C=CH_2$$

shall henceforth be known as (1) a-methyl-b-ethyl-ethylen, (2) a-methyl-ethyl-ethylen.

The same rule shall apply to bi-substituted ureas.

Nomenclature of aldehyds.—"Aldehyds shall henceforth bear the name of the corresponding alcohols, instead of the acids." Hence we shall have methylic, ethylic, and benzylic aldehyds, instead of formic, acetic, and benzoic aldehyds. A good reason for the change is that the word aldehyd is only an abbreviation for de-hydrogenated alcohol.

Nomenclature of acetones.—"In the designation of the word acetones for the word carbonyl, which is liable to misunderstanding, the term cetone shall be substituted, as it has no special meaning as yet, and corresponds to the word *ketone* used in German literature."

Consequently ordinary acetone, $CH_3-CO-CH_3$, will be called dimethylcetone instead of dimethylcarbonyl. In the same way the compound $CH_3-CH_2-CO-CH_2-CH_3$, hitherto indiscriminately called dimethylacetone and dimethylcarbonyl, will definitely be known as diethylcetone.

Designation of the group CN.—"The group CN shall keep the name of cyanogen when substituted to an atom of hydrogen." Hence, for instance, the compound C_2H_5-CN, known as ethyl cyanide or propionitrite indifferently, will henceforth bear the name of cyanethan.

Value of the termination ol.—"In the designation of hydrocarbons the termination *ol* shall be entirely discarded, and exclusively reserved for alcohols and phenols. The names of aromatic hydrocarbons shall always have the termination *en*." [*Note.*—In the French text this ending is spelled *ène*, which in Latin languages has for equivalent *ena* or *eno*, and in the German *en*. The last form has in this article been preferred to *ene*, which in English, owing to the absence of accents, is liable to be mistaken for *ine*.]

According to the foregoing rule, durol and naphthaline will become duren and naphthalen, and so on with others.

Fixing the value of the prefixes bi *and* di.—"When designating bodies formed by a duplication of the radicals, the prefix *bi* shall henceforth be employed, and *di* be kept for double substitutions. According to this convention, some names already adopted are to be gradually transformed, and diphenyl, dipropagyl, etc., for instance, shall be known as biphenyl, bipropagyl, etc."

One example will suffice to illustrate this important resolution. Let us take the two following compounds:

(1)

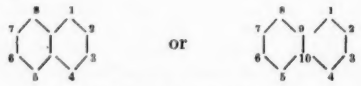
$$\begin{matrix}CH_2=CH-CH_2\\CH_2=CH-CH_2\end{matrix}\!\!>\!NH$$

and (2)

$$CH_2=CH-CH_2-CH_2CH=CH.NH_2$$

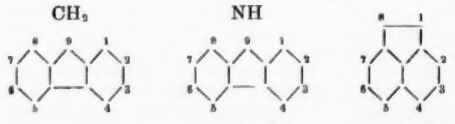
each containing allylic groups. The first, being an amine twice substituted by allyl radical, will be called di-allylamine; the second, being an amine substituted by one group resulting from a duplication of the allyl radical, will be named bi-allylamine.

Nomenclature of complicated nuclei like naphthalen, anthracen, etc.; designation of the apexes.—Complicated nuclei are, it is known, represented by regular geometric figures. When compounds derived therefrom are to be named, it is necessary to indicate on which apex the substitution of hydrogen by a radical has taken place. Such points may be designated either by numbers or by Roman or Greek letters. The Congress has decided in favor of Arabic numbers, and adopted the following order for the principal nuclei:



Naphthalen (or naphthalin)

Anthracen. Phenanthren.



Fluoren. Carbazol. Acenaphthen.

The programme bore also other desiderata, such as a system of notation for nitro-compounds and for nuclei containing other atoms than carbon and hydrogen, but the questions were not considered mature enough for a final decision, and were consequently referred to some future international congress or commission. It was hoped also by pharmacists that chemists, leaving aside for a moment pure theory, might think of practical concerns and take initial steps toward a simplification of nomenclature, so that currently used chemicals should have names not exceeding four or five syllables. But the

programme was already so heavy that it became impossible to consider outside questions, and the much-desired improvement was left in abeyance. It is perhaps unjust to ask or expect too much of one congress. So let this be praised for the good work it has done. If the resolutions adopted be generally accepted, as it is hoped they will be, important progress will have been secured towards uniformity in organic nomenclature, and simplicity will afterwards be more easily obtainable.—After *Chem. and Drugg.*

Uric Acid Estimation.

A SIMPLE and efficient method of estimating uric acid has been devised by Drs. Arthaud and Butte to supersede the processes generally employed, which they find either unreliable or too complicated. The reagent is to be made as follows:

Sulphate of Copper	1.484 Gm.
Hyposulphite of Sodium	20.00 "
Rochelle Salt	40.00 "
Distilled water	sufficient for 1 liter.

The effect of the hyposulphite is to turn the cupric into a cuprous salt, the excess of hyposulphite serving to prevent reoxidation. The Rochelle salt tends to make the reagent more stable and to hinder the formation of a sulphide. According to calculation 1.484 Gm. of the copper salt will precipitate 1 Gm. of uric acid. Hence each C.c. of the reagent will throw down 1 Mg. of the acid. The test is applied as follows: The phosphates of the urine having been separated by means of soda carbonate in excess, 20 C.c. of the filtered liquid are taken and transferred to a beaker. The reagent is now added from a graduated burette, with the usual precautions, and when the curdy, whitish precipitate ceases to form, note is taken of the quantity employed. The test will show as little as 2 Mg. in 100 C.c. of distilled water.—The Paris correspondent of the *Chem. and Drugg.*

Trichloracetic Acid as a Reagent for Albumin in Urine.

MARSAULT and LANGUEPIN have met with urine containing albumin coagulable by heat, but in which the precipitate thus formed was redissolved by acetic acid. The same fact has been observed several times by Boymond and Patein. The former has found that Raabe's reagent for albumin in urine—viz., trichloracetic acid—is a special precipitant of the peculiar kind of albumin under consideration. Other reagents precipitate it likewise, but this particular one has the special advantage that it does not modify the other forms of albumin. For this reason Raabe considers it preferable to nitric and to metaphosphoric acid.

It may be used either in a solid or liquid form. A crystal of it may be thrown into the test tube containing the urine, when it will dissolve and cause a turbidity or turbid zone. Or a saturated solution may be poured into a test tube and a layer of the urine placed on top, when a cloudy zone will be produced at the line of contact.

Should the urine be rich in urates, the reaction may appear without any albumin being present. But error is avoided if the urine is diluted with distilled water before making the test.—*J. de Pharm. et Chim.*

Estimation of Free Hydrochloric Acid in Gastric Juice.

THE process here described somewhat resembles that introduced by Sjögvist (*J. Chem. Soc.*, 1889, 302), and is as follows: 10 C.c. of the fluid in which the free hydrochloric acid is to be determined are colored with a drop or two of perfectly neutral tincture of litmus. Barium carbonate absolutely free from chloride is then added until the litmus is no longer of a reddish shade, and the neutralized solution is placed in a platinum or nickel dish, evaporated to dryness, and gradually heated so as to decompose all organic acids. After cooling, the residue is exhausted with water (not more than 80 to 100 C.c. should be used) and filtered. Lastly, the barium chloride present in the solution is estimated as barium sulphate. The extreme accuracy of this method has been ascertained by using it to estimate very small known quantities of hydrochloric acid which were previously mixed with organic solutions, such as lactic, butyric, and acetic acids.—R. v. JAKSCH in *Monatsch.*, 10, 464; after *J. Chem. Soc.*

Artificial Salicylic Acid is said by Messrs. Charteris and McLennan to contain an impurity which, until it can be extracted, should prevent internal use of it or its salts of sodium. This impurity has been separated as a buff-colored powder, which is more soluble than salicylic acid and possesses poisonous properties. It is very likely a derivation of impurities contained in the phenol used in the process. It is furthermore suggested that the retarded convalescence occurring in some cases of acute rheumatism after the salicylic treatment may be owing to the prostration which this impurity causes.

Test for Minute Quantities of Nitrous Acid.

GRIES' reaction for nitrous acid by means of alpha-naphthylamine has several drawbacks. One of them is that the solution of the reagent, though originally colorless, gradually becomes dark colored and loses its sensitiveness. Another is this, that the expected color reaction (red color) appears only very slowly in highly dilute solutions (such as 1 in 1,000 million parts). Iloway has improved the reaction, chiefly by substituting acetic in place of sulphuric or hydrochloric acid, and by keeping the two test solutions (one of sulphanilic and acetic acids, and the other of naphthylamine and water) separate.

Lunge has now found that it is much preferable to keep the reagent *mixed*, since any contamination, by its abstracting traces of nitrous acid from the air, will be at once indicated by the reagent itself acquiring a color (up to deep red). Moreover, should it have become thus colored, it may be readily restored as directed below. The reagent is prepared in the following manner:

I. Sulphanilic Acid	1	Gm.
Acetic Acid (sp. gr. 1.040)	300	C.c.
Dissolve.		
II. Alpha-Naphthylamine	0.2	Gm.
Water	40	C.c.
Acetic Acid (1.040)	300	C.c.

Boil the naphthylamine with the water, pour off the colorless solution from the bluish violet residue and mix it with the acetic acid.

Now mix the two solutions and transfer it to bottles, which must be securely stopped. Access of light does no harm, but access of air might convey nitrous acid to it.

The chief objection to keeping the two solutions separate is this, that if any nitrous acid should have been accidentally absorbed from the air by either solution, a reaction for this impurity might be ascribed to the drinking water or other liquid which is being tested for nitrous acid. Whereas, if the reagent is kept mixed, and if it is free from tint when used, this is proof itself that no nitrous compound was present in the reagent.

Should the reagent become colored by absorption of nitrous acid, the latter may be destroyed and the reagent rendered colorless and fit for use again by shaking it with zinc dust and filtering in an atmosphere free from nitrous acid. The colorless filtrate reacts as well as the original test liquid.

The red color appears even in exceedingly high dilutions. In a solution of 1 part of nitrous acid in 1,000 million parts of water it appears within one minute. It is curious that in strong solutions (say 1 in 1,000) the color produced is only yellow, unless a concentrated solution of naphthylamine is used for preparing the test liquid.—After *Zeitsch. f. ang. Chem.*, 1889, 666.

Purification of Benzin.

MR. GEO. M. BERINGER recently read a paper on this subject before the Philadelphia College of Pharmacy. We take from it the following:

The U. S. Pharm. of 1880 designates as benzin that portion of the (purified) distillate of American petroleum which has a specific gravity of 0.670 to 0.675, and a boiling point of 50° to 60° C. (122° to 140° F.).

Mr. Beringer finds that a benzin answering to these requirements is exceedingly hard to obtain. Benzin of the low specific gravity required by the Pharmacopœia is usually designated gasoline. Moreover, every specimen of commercial deodorized benzin which the author examined was so contaminated with pyrogenous and sulphurous impurities that it was totally unfit for any refined purposes.

He furnishes an easy method by which benzin may be freed from these impurities. The method consists simply in oxidizing the sulphur compounds, etc., by means of permanganate of potassium. He directs this to be done in the following manner:

Mix one-half pint of sulphuric acid with 3½ pints of water, and allow to cool. Then pour it into a 2-gallon bottle and dissolve 1 av. oz. of permanganate of potassium in it. Next add 1 gallon of benzin and shake thoroughly and frequently in the course of twenty four hours. Separate the benzin and again shake it frequently in the course of several hours with a mixture of water 2 pints, caustic soda one-half av. oz., permanganate of potassium one-half oz. Then separate the benzin and wash it with water. The author thinks that the treatment with the acid permanganate solution may be shortened by an hour or two. Besides, a foul benzin may require the quantity of permanganate above indicated, while a better kind may require very much less.

When benzin thus treated is tested for offensive sulphur compounds—by boiling with ammoniacal alcohol and treatment with silver nitrate - no reaction is obtained.

When an exceptionally fine article is required, the benzin thus purified by permanganate need only be rectified by fractional distillation from lard or some other fatty substance, as recommended by Dragendorff, and that portion only collected which passes over below 45° C.—After *Am. Jour. Pharm.*

Estimation of Theine in Tea.

HILGER recommends the following plan: 10 to 20 Gm. of the sample of tea are submitted to three successive treatments with boiling water. A slight excess of basic lead acetate is added to the filtered extract, the precipitate being collected, washed, and decomposed with hydrogen sulphide. The filtered solution, from which the lead has thus been removed, is evaporated to dryness with addition of pure sand, granular marble, magnesia, or chalk. The dried mass is now thoroughly extracted with chloroform in a Soxhlet apparatus, the residue left after the evaporation of the chloroform being dried for three hours at 100° and weighed. By repeatedly crystallizing the residue from water or alcohol, it may be obtained colorless.

Waage has examined thirty-seven methods proposed or used for the determination of theine, and gives preference to the methods of Mulder, Fricke, Stahlschmidt, and the one described above, but considers Mulder's method, with some slight modifications, the best. The modified method is as follows: 10 Gm. of tea are extracted by four treatments of boiling water, taking altogether four hours' time. The filtered extract, measuring about 2 liters, is evaporated to a syrup, mixed with 2 Gm. of pure calcined magnesia and 5 Gm. of sand, and, after being thoroughly dried, is submitted to extraction with anhydrous chloroform in a Soxhlet apparatus. The chloroform is evaporated, a slightly colored residue being left which contains fatty and resinous matters. These impurities are removed by dissolving the residue in hot water and filtering; the filtrate is evaporated to dryness and weighed after being heated to 100° for two hours.

M. Hoffmann and R. Tittelbach also recommend Mulder's method, but the former considers it necessary to treat the aqueous extract with lead acetate to remove tannin and coloring matters as much as possible, precipitating the lead from the filtrate with hydrogen sulphide.—*Arch. d. Pharm.* and *J. Soc. Chem. Ind.*, 1889, 822.

Delicate Reaction for Rosin.

TH. MORAWSKI communicates the following very delicate reaction to recognize the presence of pine resin in paper, soap, wax, etc. (in *Mitth. d. Gewerbemuseums, Wien*).

Dissolve a small quantity of rosin (pine resin), in a dry test tube, by means of acetic anhydride ($C_4H_6O_3$; *not* absolute acetic acid) and a gentle heat. Cool off, and cautiously allow a drop of sulphuric acid to run down the inside of the test tube. This will cause the appearance of intensely red to bluish-violet tints, which soon disappear again, however, when the liquid assumes a brownish-red color and a distinct fluorescence.

This reaction takes place also when the quantity of resin is very small. A faint violet tint may still be observed if only 1 Mg. of rosin was dissolved in 5 C.c. of acetic anhydride.

If rosin is to be tested for in paper, the latter is cut, some acetic anhydride poured over it in a dry test tube, and heated to incipient boiling. The liquid, after cooling, is then poured into another dry test tube and the test performed therein as above directed.

Bromoform in Whooping Cough.

DR. STEPP, of Nürnberg, publishes in the *Deutsche medizinische Wochenschrift* a large number of cases of whooping cough in which he claims to have obtained most satisfactory results from the internal administration of bromoform. The drug has, according to the author, no ill effect of any kind, and his numerous observations have proved that bromoform, as applied by him, is non-poisonous, and that the pulse and temperature remain unaffected by it. The action of bromoform is entirely different from that of bromide of potassium, as has been observed in epilepsy, the former being rather an excitant than a sedative. Children are ordered from five to twenty drops during the twenty-four hours, in very frequent doses. The solubility of bromoform in water being very slight, the mixture requires the addition of alcohol. The author has administered bromoform in about sixty-five cases of whooping cough, the children mostly ranging in age from six months to seven years. The longest time required for a complete cure was four weeks. Symptoms of pulmonary catarrh in all these cases were entirely absent, or else they were very slight and soon disappeared. No complications existed in any of the cases observed by the author, but Dr. Goldschmidt has treated several serious cases of whooping cough complicated with pneumonia, completely curing them in a fortnight by the daily administration of bromoform. Dr. Stepp concludes from his observations that under bromoform treatment bronchial catarrh and lobular pneumonia do not generally occur, and that where they exist at the commencement of the treatment resolution takes place with facility and at an earlier period than under other methods of treatment. His observations showed also that the dose of bromoform must be in direct proportion to the severity of the affection and the age of the patient. The system does not seem to become accustomed to the drug, which has, moreover, considerable prophylactic power, so that the other children of a family in which whooping cough in an advanced stage already exists can be shielded from the disease by being given bromoform. Dr. Stepp believes that bromoform is either excreted unaltered by the lungs, or is separated into its elements, and that the free bromine is excreted by the lungs. In this way an effect on the bacilli of the whooping cough could be easily supposed to result.

Concentrated Infusion of Senega.

MR. A. S. BUCK presented at a recent meeting of the Liverpool Chemists' Association a sample of concentrated infusion of senega which had a color which was not too deep, a perfect aroma and taste, which he had made by repercolation with the aid of lamp chimneys. The quantity of water used was little in excess of the volume of product, and no evaporation or heat was required. In making 1 pint, take 8 oz. of root ground to a uniform coarse powder, and distribute it through five of the glasses. This seems to be the least number that can be employed for the complete exhaustion of the drug by this process. Into No. 1 put 3 oz. of water. Any percolate collected is passed into No. 2, more water being put into No. 1, and so on, until 16½ oz. are collected from No. 5. By this time the water is passing through the marc without taste and almost colorless, the marc itself being tasteless. To the 16½ oz. add 3½ oz. rectified spirit. A precipitate is immediately thrown down, and this deposit goes on increasing for some days. Of this solid matter the author takes no notice, as he finds that upon dilution, and on the addition of but a small quantity of ammonia, a very elegant mixture is produced.—*Pharm. Journ.*

Note by Ed. Am. Drugg.—We reprint this here for the purpose of attaching a brief remark. Concentrated Infusions are preparations which are "time-savers," but have not met with much encouragement in this country. In some cases the addition of alcohol to preserve such a "concentrated infusion" will, no doubt, do no harm and merely preserve it. In others, it will precipitate a part of the active principle. On the other hand, in certain cases, an aqueous infusion is more or less inert, since the active principle may not be soluble in water, or but indifferently so.

Naregamia alata, described first by Hooker, has recently been used in the General Hospital of Vienna. The active principle of this plant has been named naregamine. It is, we are told, an alkaloid which forms crystallized salts with the various mineral acids. In addition to the alkaloid, the bark of the rhizome contains wax, gum, asparagin, starch, but no tannin.

The natives on the coast of Malabar, where the *Naregamia alata* is indigenous, employ it as an emetic, and as a remedy in bilious conditions, rheumatism, and digestive disorders. It has likewise been recommended in dysentery and in bronchial catarrh. In the General Hospital at Vienna this new remedy is employed in the form of a fluid extract, or in the form of pills or tincture. The dose of the fluid extract is stated to be from 30 to 40 drops in water flavored with laurel water.

Another product is known as Artar root (*Xanthoxylon senagalense*). In the bark of this plant no less than four alkaloids have been found, one of which, that has been named artarine, appears to be very similar to berberine in constitution; but at present we know very little about the properties of the others.—*Monthly Magazine.*

Lotion for Frost-bite.—Dissolve 3 drachms each of borax and alum in a pint of distilled water, and, after solution has been completely effected, stir in carefully 1 fl. oz. of tincture of benzoin. This is especially recommended by Liebreich.—*Monthly Magazine.*

An **ointment** consisting of 45 grains of camphor oil to the ounce of lanolin is also spoken of with favor.

Diuretin is the fanciful (and probably proprietary) name for a sodio-salicylic compound of theobromine, corresponding to one of the soluble salts of caffeine. It has been advanced (*Apoth. Zeitung*, December 14th) as an advantageous diuretic, acting directly on the kidneys and differing from caffeine in not affecting the nervous system and not causing wakefulness and restlessness. It *is said* to have produced diuresis in cases of heart and renal disease in which digitalis and strophanthus have had no effect. As the uncombined alkaloid requires 1,600 parts of water for its solution, it is not readily absorbed and causes disturbance of the stomach. It is a white powder, said to contain 50 per cent of theobromine, dissolving with the aid of heat in less than half its weight of water, and remaining in solution after the liquid has cooled. It is administered to the extent of 90 grains daily in 15-grain doses.—*Pharm. Journ.*

Chaulmugra Plants have, it seems, been successfully introduced at Réunion by the director of the Botanical Gardens. The trees are reported to be very difficult to propagate, and still more so to transplant. Hence the comparatively limited area over which they are found, notwithstanding the great medicinal value of the oil extracted from the seeds. Chaulmugra oil is probably the only known remedy that will, not cure leprosy, but alleviate it, and it is to this object that the plant owes its introduction in the Réunion Island.—*Chem. and Drugg.*

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EDITORIAL.

As the time for holding the pharmacopœial convention approaches, it is natural that suggestions should become more numerous and relate to all features of the work, from the composition of the committee to supervise the next revision to the details of publication; but it is notable and much to be regretted that, thus far, physicians seem to be devoting but little attention to the subject, and that the burden of the discussion and of proposing improvements and changes is being left to pharmacists. It is not improbable, therefore, that the convention to assemble in May will be more distinctively pharmaceutical than any which have preceded it, and it may be that the same will be true of the committee for revising the work. Considering the nature of the work to be done by the revising committee, there are some reasons why this should be so. The chief opportunity doctors can have for rendering service on such a committee, as physicians, and not on account of individual qualifications, is in deciding upon the admission or exclusion of articles to be considered. This is, however, a very limited field for usefulness as compared with questions of pharmaceutical manipulation, chemistry, and nomenclature; and with a majority of members representing pharmacy rather than therapeutics, the latter are very likely to be outvoted in the settlement of even this matter (as was the case with the present committee), unless it is definitely understood in advance that the decision with regard to the admission or exclusion of articles is to be left to the medical members.

This stage of the work having been passed, there remains little which calls for the presence of physicians, as a class, on the committee entrusted with the details of revision. Competent authorities on nomenclature, botany, pharmacy, and chemistry are much more commonly met with among pharmacists, and unless the committee should choose to delegate to the medical members the details of matters relating to finance and publication, there will remain little for them to do of an important character.

The work done by the present committee of revision towards obtaining from dispensing pharmacists in various sections of the country, reports of the relative frequency with which individual medicines are prescribed, does away, in a great degree, with the need for physicians upon the revision committee; since it is possible, by this means, to arrive at a better estimate with regard to the demand for any particular article, than by relying upon the opinions of any available number of physicians, each of whom can, in the nature of things, express only an individual opinion, based, mostly, on his personal experience.

It would seem desirable, therefore, to develop in the future this plan for obtaining detailed reports through pharmaceutical societies, regarding the extent to which articles are prescribed, as a basis for the matter contained in the Pharmacopœia, rather than follow the custom heretofore adopted, of relying (theoretically) upon the opinions of medical members of the revision committee.

There are, however, good reasons why the presence of a reasonable proportion of medical men upon the committee should be insisted upon. So long as physicians are expected to conform in any degree to the Pharmacopœia in their prescriptions, they must share in the responsibility if not in the actual labor of its revision and publication, and when they cease to be represented on the committee they will cease to be represented in the convention, or to regard the Pharmacopœia as a work in which they have any professional interest. When this time comes doctors will have adopted, even more generally than now, the practice of designating the products of particular manufacturing pharmacists to be used in filling their prescriptions, and the condition of things which preceded the establishment of a pharmacopœia will have returned in a great degree. The acceptance of the Pharmacopœia as an authority, and confidence in its preparations, depend in so large a measure upon the co-operation of the two professions that every encouragement should be offered to physicians to participate in the work of revision. However little the majority of the medical profession may appreciate its importance, the Pharmacopœia still remains of equal value to pharmacists and physicians, and both must co-operate in it. There is imminent danger of much trouble in the future from a misapprehension of this question, and the pharmacists in the coming convention should, in their own interests, insist upon a division of responsibility in the next revising committee.

In the selection of articles which are to become official (or pharmacopœial), the decision should be in favor of a greater rather than a lesser number. It may be safely asserted that in just so far as the Pharmacopœia fails to provide standards for nomenclature, composition and strength of articles which physicians prescribe at all, does it favor the development of proprietary articles and the prescribing of products of special manufacturers. So, too, the omission from the Pharmacopœia of articles which have been official, and *have* had a definite composition, permits their legal sale under a well-known title, but with variable composition. Indeed, the present need of both the pharmaceutical and the medical professions is rather in the direction of amplification than diminution of the list. The fact that an article is official does not render its frequent use obligatory, nor is it even essential that every pharmacist should have it in his stock. No one thinks the less of an encyclopædia, a dictionary, or any other book of reference for facts and standards, because it contains a great many words or facts which are but rarely used or referred to; and no one has yet been so foolish as to suggest that, after the trouble has been taken to establish certain truths, meanings, or accepted definitions, because they do not happen to be in daily demand they should be expunged from current editions and their use abandoned. So it should be with the Pharmacopœia. An article once included, and standards for its composition and purity having been established, it should remain. Corrections should be made of ingredients, processes, strength, etc., as called for by the experience and understanding of subsequent revisers; but having been of sufficient importance to justify its consideration at one time, there it should *stay*, so that future readers may at least know what it was when it *was* in demand. The ignoring of this need has helped the growth of the dispensatories and decreased the demand for the Pharmacopœia until the latter has degenerated into a means for increasing the profits to be made out of the former.

To further increase the usefulness of the Pharmacopœia, every title should, after the matter at present included,

contain, in the form of subordinate notes, a description of the differences between this and the corresponding article in former editions and in other pharmacopœias; the date of its original admission, and such of its incompatibilities as are liable to produce toxic or harmful compounds, or such as are therapeutically inert.

The question of dosage is not one of *fact*, and therefore should have no place in the book, any more than that of the price to be charged for each article. Both are subject to wide variations according to circumstances. It may be that the German government requires the maximum single and daily doses to be incorporated in their pharmacopœia; but so, too, it enacts laws regulating the prices which pharmacists may charge for these articles. If we need the one, we need the other quite as much, in view of the present tendency towards price-cutting. If a pharmacist is unable to decide whether the amount of any ingredient in a prescription is excessive, or the dose directed is likely to be harmful, let him buy any one of the numerous dose books or text books on therapeutics, such as are to be found in every medical student's library, and he will possess all the necessary information on this head as well as on many others. Physicians certainly have no need for such an official declaration of what they may use, and have little sympathy with this scheme to incorporate, in a work of such an authoritative character, standards which do not exist in fact, and which may be used to their disadvantage in many ways besides in suits at law.

It has been said that the pharmacist needs some such authoritative standard for his own protection in a case where he has dispensed an unusual dose. It may also be said that in case the dose seems to him excessive according to the information contained in the usual works of reference—such as above mentioned—he has no right to dispense it at all without being assured that it is exactly what the prescriber intended, and in such a case the official posological table would be but little protection, but would help to convict him of criminal negligence if the dose was excessive and had been dispensed without the approval of the prescriber. Furthermore, it may be said that a pharmacist would be justified in declining to assume responsibility even under the latter condition, and may refuse to dispense the prescription at all.

Paul Balluff.—It is with great regret that we have to record the death, on January 8th, of Paul Balluff, for many years one of the most prominent German-American pharmacists of this city. He was born at Riedlingen, a small town of Württemberg, on January 10th, 1816. His first pharmaceutical education was imparted to him by his father, and he subsequently perfected himself by accepting engagements in various cities of Germany and Switzerland. Having completed his studies at the University of Tübingen he passed his final state examination with honors, and then became manager of a pharmacy. In 1852 he came to this country, profiting by the advice of his life-long friend and fellow-student, Mr. Gustavus Ramsperger, and opened a pharmacy in Williamsburg, which he conducted until 1865, when he became a partner in the pharmacy of J. Faber & Co. (38th street and Sixth avenue) of New York. Two years later G. Ramsperger bought out Mr. Faber, and in 1872 Mr. Balluff became sole owner, transferring the business subsequently to the corner of 37th street, where it has since remained.

Although the deceased led of late for several years a somewhat retired life, partly owing to the loss of a beloved wife and other domestic afflictions, and partly to enfeebled health, his activity and prominence in all matters relating to the profession of pharmacy and its advancement, as well as to other affairs relating to public health, charity, and scientific progress, will always be vividly in the remembrance of those who had the privilege of being acquainted with him, and still more so in that of his personal friends. The writer enjoyed this privilege for over twenty-two years, and knows that he only voices the sentiment of all who have known the deceased, that he was a man of noble and lofty aims, of spotless reputation, of energy and determination; a man who hated cant and sham, but who was a fast and true friend to those whose convictions were congenial to his.

He was one of the leading members of the German Apothecaries' Society, which he joined soon after his arrival in this country, and also of the College of Pharmacy of the City of New York, in both of which bodies he repeatedly held the office of president, as well as other offices of trust and honor. It was mainly due to his energy that the pharmacy law of 1872 was successfully passed through the Legislature. He was for many years an active member of the "Gesellig-wissenschaftlicher Verein" and of the German Hospital. He leaves a distinct void in the circles in which he moved, and his name will always be held in honored remembrance.

Emlen Painter, President of the American Pharmaceutical Association, died on January 15th at his home at Spuyten Duyvil, N. Y. He was born in 1844 at Concord, Pa. Having been brought up and educated under the care of the Society of Friends, he commenced his professional career with Charles Shivers, of Philadelphia, attended the Philadelphia College of Pharmacy, and graduated in 1866. Next year he removed to San Francisco, where he soon rose to prominence in his profession, eventually becoming one of the founders of the California College of Pharmacy, and subsequently holding therein various offices, especially that of professor of pharmacy. In 1883 he removed to New York, where he became the owner of the pharmacy at the corner of 34th street and Sixth avenue. Though somewhat enfeebled in health, he became a most active worker in pharmaceutical and educational organizations, notably as a trustee in the College of Pharmacy of the City of New York, and as a member and officer in the American Pharmaceutical Association. He contributed largely, by extensive experiments and special studies, to the success of the National Formulary, and was the author of many valuable papers. For some years past he showed incipient signs of phthisis which gave much concern to his friends, and the insidious disease rapidly developed after his return from the annual meeting of the Association at San Francisco, so much so that he was compelled to dispose of his business and to seek relief by going to a more favorable locality. Feeling the end approaching, he returned home, where he passed away four days later, regretted by a large number of friends. His remains were taken to Darley, Pa., for interment.

Dr. Walter De F. Day, for many years Sanitary Superintendent, and for twenty-two years Professor of Botany and Materia Medica in the College of Pharmacy of the City of New York, died on November 27th last. He was born at Catskill, N. Y., in 1835, graduated at Williams College, and in 1863 at the College of Physicians and Surgeons, New York. Having served in a medical capacity during the war, and rendered very efficient service in hospital organization in the Army of the Potomac, with evidence of superior executive ability, he was appointed in 1873 as Sanitary Superintendent of New York City. Serious ill health compelled him to resign this office in the summer of last year, and only a few months thereafter he passed away. He was a member of various medical societies, and held several honorary positions, tendered to him in recognition of his worth and scientific attainments.

Toronto Dispensing Charges.—The Druggists' Association have at last agreed upon the prices which are to be taken as minima. The following are examples of the charges for mixtures:

1 oz.....	20 cents.	6 oz.....	50 cents.
2 ".....	25 "	8 ".....	60 "
3 ".....	35 "	12 ".....	75 "
4 ".....	40 "	16 ".....	$1.00

The way in which the price is to be marked on prescriptions is to put down five times the charge and mark x. s. below it; thus for the 2-oz. mixture $\frac{125}{x.s.}$

Usefulness of Japanese Lacquer.—Mr. R. Hitchcock says that the use of Japanese lacquer deserves more general attention. "It gives a surface to wood much harder than the best copal varnish, without brittleness. It takes a polish not to be excelled, which lasts for centuries, as we may see in the old treasures of Japan. It is proof against boiling water, alcohol, and, indeed, it seems to be insoluble in every agent known. It is the best possible application for laboratory tables. I have a set of photographers' developing trays that have been in use for more than a year, and I find them excellent and cheap. In Japan it is used for many household articles."

Aqueous Solutions of Essential Oils.—It has been found by Bergmann that while mixtures of the fixed alkali soaps with hydrocarbons and essential oils form only emulsions in water, under separation of the respective oils, a mixture of an ammonia soap with an essential oil will form a clear solution in water, especially in the presence of an excess of ammonia (*Chem. Zeit.*, November 6th). Turpentine oil, or some other essential oil, is first mixed with castor oil, or a mixture of it with some other fat oil; the mixture is then subjected to the action of concentrated acid, and the product, after being washed with solution of salt, is saturated with ammonia in excess. Or the fat acids may be first separated by treatment of the fatty oil with concentrated acid, then washed with salt solution, and the essential oil added either before or after saturation with ammonia. The preparation thus obtained is said to form a clear solution, and not only to possess the properties of a soap, but also to exercise, in aqueous solution, the solvent action of an essential oil.—*Pharm. Journ.*

QUERIES & ANSWERS.

Queries for which answers are desired, must be received by the 5th of the month, and must in every case be accompanied by the name and address of the writer, for the information of the editor, but not for publication.

No. 2,406.—**Glue in Powder** (G. B. E.).

We have been informed by persons who have had some experience in the glue industry that glue can be reduced to powder only during cold weather in winter time. The glue to be used for it must have been deprived of as much of its water as possible. Any of the leading dealers in paints and dye stuffs can probably furnish it.

No. 2,407.—**High Specific Gravity** (Chicago).

We are asked to suggest a liquid, insoluble in water, which has a specific gravity of 3 or over, and which would be suitable as a liquid in which determinations of specific gravity could be made. By inspecting the tables contained in Carnelly's well-known work, several liquids might be suggested, but we content ourselves with mentioning one, recommended by J. W. Retgers for a similar purpose, namely, methene di-iodide, CH_2I_2, otherwise known as "methylene iodide" ("Methylenjodid," or "Jodmethylen," in German). This has a spec. grav. of 3.342 at 5° C. It is miscible with benzol, and in this way a range of spec. grav. between about 0.890 and 3.3 may be obtained.

It will be found most economical to purchase this liquid ready-prepared, as it is somewhat troublesome to make. Kahlbaum, of Berlin, quotes it at 10 marks per 100 Gm.

No. 2,408.—**Bookbinder's Paste** (G. F.).

Bookbinder's paste may be prepared in the following manner:

Soak 4 parts of best glue in 15 parts of cold water until it is quite soft, then melt it with a gentle heat, and add to it 65 parts of *boiling* water. In another vessel mix 30 parts of previously prepared starch paste (of the usual gelatinous consistence) carefully and uniformly with 20 parts of cold water, so as to produce a milky mixture free from lumps. Now heat the glue solution near to boiling, and pour it, under continuous stirring, into the diluted starch solution. The product will keep for some time, but may be rendered more permanent by the addition of a little carbolic acid.

It is customary, we believe, to add a small amount of alum to this paste to increase its adhesive property, as well as to aid in its preservation.

No. 2,409.—**Determining Sugar in Urine by Fermentation and Specific Gravity** (S. J. D.).

Roberts' method consists in determining the specific gravity of the urine at 20° C. before and after its fermentation, and multiplying the difference between the two specific gravities by 230, whereby a figure is obtained which expresses, approximately, the percentage of glucose.

Urine containing sugar has a higher specific gravity than normal urine. When the sugar has been caused to undergo fermentation, the resulting products are carbonic acid gas, alcohol, and water. The CO_2 passes off, and the residuary urine has naturally a lower specific gravity than the original urine. By numerous experiments it has been found that there is a definite ratio between the amount of sugar and the reduction of the specific gravity. If the temperature of 20° C. (68° F.) is carefully maintained while taking the two specific gravities, a close approximation to the true percentage of sugar is obtained by multiplying the difference with 230, as stated above.

Assuming we had a urine having the specific gravity of 1.0327 at 20° C. If it is not quite clear, it must be filtered. And if it does not have an acid reaction, strong solution of tartaric acid is added, in drops, until it is acid. [If small amounts of albumin are present these may be disregarded. Larger quantities are preferably removed by heating a sufficient quantity of the urine in a hermetically closed bottle immersed in boiling water, and subsequent filtering.] We now take a small piece of compressed yeast, which is best subjected to a preliminary purifying process. For this purpose it is triturated in a mortar with a little water, the latter decanted, the yeast washed by decantation with more water, and then the moist residue transferred to an ash-free filter. When it has drained, the filter is spread out on blotting paper and it may then be used at once or after partial drying. This purified yeast is now triturated with the urine, the whole transferred to a flask which is closed with a notched cork, and the flask set aside, at a temperature of 25° to 30° C. (77° to 86° F.), during twenty-four hours (at a lower temperature thirty-six to forty-eight hours may be necessary). The urine is then filtered through an ash-free filter and the specific gravity again taken at 20° C. If any difference has been found, the urine is once more treated with yeast and the specific gravity again taken after twenty-four hours. If there is a new loss, the last weight is taken to calculate the difference. Supposing after the first twenty-four hours the specific gravity had been 1.0195, and after further twenty-four hours 1.0175, we would then say:

$$\begin{array}{r} 1.0327 \\ 1.0175 \\ \hline 0.0152 \times 230 = 3.496 \end{array}$$

that is, the urine would contain 3.496 per cent of glucose.

If it is impossible, for some reason or other, to take the specific gravity exactly at 20° C. (68° F.), then a deviation of 3 degrees either way may be compensated for by adding to the obtained specific gravity 0.0002 for every degree above 20° C., or by deducting 0.0002 for every degree below 20° C. A difference of temperature of less than half a degree may be neglected.

The specific gravity may be taken by any method which will indicate the fourth decimal. A hydrometer or urinometer will not answer for this purpose. There are only two good methods available. The best is by means of a specific-gravity bottle or pycnometer, and the next best is the specific-gravity balance (Reimann's or Westphal's).

No. 2,410.—**Antifebrin** (A. J. W.).

We have published numerous articles, during the last few years, giving an account of the chemistry, history, properties, etc., of antifebrin. We might refer specially to our volume for 1888, pages 3, 51, 118, 152, etc.; for 1889, 75, etc. (see index). Briefly recapitulated, the chief points of interest are the following:

Chemistry.—Antifebrin is a specially coined name for a chemical long known under the name acetanilid, the medical properties of which had been overlooked until 1887, when Drs. Cahn and Hepp, of Strassburg, discovered them.

It is prepared by heating pure aniline ($C_6H_5NH_2$) with glacial acetic acid for several days under a return-condenser, and subsequently distilling the product. At 295° C. pure acetanilid distils over, the hot distillate congealing to a crystalline mass on cooling.

Properties.—Colorless or whitish crystals or lamellæ, odorless, having a slightly burning taste, soluble in about 200 parts of cold and 18 of boiling water, and in 3.5 parts of alcohol. It is neutral to test paper.

For *Tests of Purity* we refer to our previous issues.

Medical Properties.—Prompt antipyretic. For this reason it was named "antifebrin," and became the first rival of antipyrine. In healthy persons it does not diminish the temperature of the body. In fever, however, it causes a lowering of temperature by several degrees. It has also been used, with moderate success, in some forms of neuralgia and rheumatism, particularly also in migraine and "katzenjammer." Sometimes it produces a cyanotic appearance.

Dose and Administration.—The average dose for adults is 4 to 15 grains. Owing to its poor solubility in water, it is best administered in warm liquids, or in a weak alcoholic menstruum, such as wine, aromatic elixir. It may also be given in powder, best triturated with some sugar or sugar of milk, or in capsules or pills.

Further information on this and other new remedies may be found in the well-known work, "Die neueren Arzneimittel," von Dr. Bernhard Fischer (fourth edition, 8vo, Berlin, 1889).

No. 2,411.—**Lanolin** (M. & S.).

Regarding this ointment base, we may refer to various papers published by us in former issues (volume for 1886, pages 43, 62, 77, 90, 98, 108, etc.; for 1888, pages 51, 188; a paper by C. S. Hallberg on page 148 of the issue of August, 1889, etc.). By way of a condensed summary likely to convey all the information asked for by our correspondents, we give a translation of the article on Lanolin from Beckurts and Hirsch's "Handbuch der praktischen Pharmacie" (vol. ii., page 183):

LANOLINUM.

Adeps Lanæ. Lanolin. [*Prepared*] *Wool Fat.**

A mixture of water and of various fatty-acid compounds of the alcohols known as cholesterin and isocholesterin of the formula $C_{26}H_{44}O$. It is obtained from crude suint (wool fat), a fatty secretion of sheep's wool, but, according to Liebreich, it is also contained in the fatty excretions of other keratin tissues, such as the human skin and hairs, feathers of geese, chickens, pigeons, etc. It has these advantages over other fats, that it does not become rancid, that it can take up a large quantity of water, is easily miscible with various medicaments, and is better absorbed by the skin, without causing irritation.

Lanolin is prepared, according to B. Fischer, from the crude suint, which is obtained in the wool-washing establishments by decomposing the wash water with acids, and which contains not only the fatty-acid compounds of cholesterin and isocholesterin, but also some 30 per cent of free fatty acids, and, besides, some odorous and colored impurities. The modus operandi is about the following, though it should be stated that the method of preparing

* The technical name for wool fat is *suint*, not *lanolin*. The latter is a name given to the purified product by Liebreich, who has patented the process and has a proprietary right to the name "lanolin."

pure lanolin is kept secret by the manufacturers: At first the crude suint is treated with caustic alkalies, whereby a milk is produced, which is separated, by centrifugal action, into two layers, the lower one of which contains the contaminating fatty acids in form of a soap solution, while the upper one contains the cholesterin fats emulsionized by the alkali. From the latter a crude lanolin (contaminated with a calcium soap) is precipitated by calcium chloride. By remelting and washing the precipitate, a purified product is obtained, which is converted into lanolin by kneading with water. From the "centrifugal" lanolin—which has a rather dark-yellow color—pure lanolin is obtained by melting with a little caustic lime (prepared from marble), extracting the mass with acetone, distilling off the acetone from the solution, and finally incorporating 25 per cent of water by kneading. [More recently, anhydrous lanolin is put on the market.]

Lanolin (containing 25 per cent of water) is a white, unctuous, almost odorless, neutral mass, melting at about 40° C. (by warming on a water-bath), and then separating into an aqueous and a supernatant oily layer (pure lanolin). Lanolin is insoluble in water, but it takes up more than its own weight of it without losing its unctuous consistence. In alcohol it is partly soluble, and, after removal of the water by heating on a water-bath, easily soluble in ether, benzin, or acetone. Aqueous solutions of alkalies do not saponify lanolin; only by the action of alcoholic potassa at a higher temperature, or by fusing it with caustic alkali, can the substance be separated into cholesterin and fatty acids. This resistance to saponification explains the fact that lanolin does not easily become rancid. On dissolving 0.1 Gm. of lanolin in 3 to 4 C.c. of acetic anhydride, and adding concentrated sulphuric acid in drops, a rose-red tint is produced which soon passes into green or blue (this is known as Liebermann's cholestol reaction).

If 0.1 Gm. of lanolin, previously deprived of water by melting, is dissolved in 5 C.c. of chloroform, and this solution carefully poured on top of a layer of concentrated sulphuric acid contained in a test tube, a fiery brownish-red zone makes its appearance at the line of contact, and the chloroformic layer immediately above the zone shows a violet tinge (Salkowsky; Vulpius).

On drying lanolin to constant weight at 100° C., it should not lose more than 30 per cent in weight (absence of undue proportion of water). When it is heated with solution of soda, it should not give out ammonia, and when kneaded with an equal weight of water it should not assume a soapy character. A solution of 2 Gm. of lanolin in 10 C.c. of neutral ether should not be tinted by the addition of 1 drop of phenolphthalein solution (absence of alkalies), but should assume a deep red color upon addition of 1 drop of normal solution of potassa (free fatty acids). Upon ignition, lanolin should not leave more than 0.1 to 0.3 per cent of fixed residue, and this should not change the color of moistened litmus paper.

No. 2,412.—**Valuation of Meat-Peptones** (Chicago).

Our knowledge of the changes which albuminoids undergo when passing from the insoluble to the soluble condition, particularly when the albuminoids reacted upon are not single bodies but complex mixtures, is rather fragmentary as yet. There is no agreement among analysts either as to what products the analysis should establish as present, or as to their relative proportions, or even as to the processes by which they are to be determined. In view of this uncertainty, we cannot, perhaps, do better than give a brief outline of a method of testing peptones proposed last year by König and Kisch (in *Zeitsch. f. Anal. Chemie*, 1889, 191), which has at least the merit of establishing a few constituents with reasonable certainty and accuracy. A few preliminary remarks are first added, regarding peptones in general, from the same authors' paper.

It is usually supposed that commercial peptones are prepared by digesting albuminoids by peptic or pancreatic digestion. It appears, however, from evidence accessible to the authors, that many of these products are prepared, without digestive ferments, simply by heating natural beef, or beef deprived by water, of extractive matters and gelatin, with or without hydrochloric acid, under strong pressure. Now, while there is still much uncertainty regarding the very nature of albuminoses and peptones proper, there certainly must be still more regarding the composition of these commercial products. For it is not likely that the meat solutions produced by heat under pressure (with or without acid) have the same value as the products of the digestion of meat by means of digestive ferments.

When the question is raised, which features are to be specially inquired into by an analytical chemist who is asked to make a comparative examination of different brands, the following points appear to the authors to be of importance and fairly well determinable:

1. Water.
2. Fat.
3. Ash.
4. Insoluble Albuminoids.
5. Coagulable Albuminoids.
6. Products of Digestion.
   I. First Stage: So-called Albuminose.
7. II. Final Stage: Peptone.

These may be determined in the following manner:

1. *Water.*—Weigh accurately 10 to 20 Gm. of the peptone (according as it is more or less liquid) into a tared capsule containing sand, incorporate it thoroughly, if necessary with the help of water, and dry to a constant weight.

2. *Fat.*—Extract the residue from the first operation with ether. On evaporating the ether the fat will be left behind.

3. *Ash* [Process of ED. AM. DRUGG.]—Into a platinum capsule containing some recently ignited asbestos-wool pour gradually a weighed quantity of the peptone. The latter must be well incorporated with the asbestos by means of a platinum wire tared with the capsule. Apply a heat sufficient to expel the water rather briskly without spattering. When a weight of peptone about equal to that of the asbestos has been added, evaporate to dryness, and then ignite very gradually and gently to avoid loss. Press the asbestos frequently against the red-hot capsule until ignition is completed. Increase of weight represents ash in peptone.

4. *Insoluble Albuminoids.*—Dissolve a weighed quantity of the peptone (5 to 10 Gm.) in water, filter through Swedish filtering paper, dry the filter, and determine nitrogen by Kjeldahl's method. Multiply the nitrogen found by 6.25. This gives the amount of insoluble albuminoids. A less accurate way is to weigh the dried filter and to regard the increase of weight as insoluble albuminoids.

5. *Coagulable Albumen.*—The filtrate obtained from the insoluble albuminoids is acidulated with a little acetic acid, then boiled, and if any flakes separate these are filtered off and nitrogen determined as under preceding paragraph.

6. *Products of Digestion, etc. I. First Stage: So-called Albuminose.*

Prepare a solution of the "peptone," and free it from insoluble and coagulable albumen. The quantity of "peptone" to be taken is about 5 Gm. in the case of dry peptone, 10 Gm. in that of syrupy, and 20 Gm. in that of liquid peptone. Make the solution by filtration up to 500 C.c. Take a suitable portion of this (50 to 100 C.c.), concentrate it to 10 C.c., and then mix it with 100 C.c. of a *saturated* solution of ammonium sulphate, cold. Collect the precipitate on a tared filter, wash with the saturated solution of ammonium sulphate, dry and weigh. Part of the excess of ammonium sulphate effloresces on the funnel. Next dissolve the contents of the filter (throwing the latter into the solution) in water to 500 C.c., and determine in an aliquot part, acidulated with hydrochloric acid, the sulphuric acid by means of chloride of barium. The barium sulphate obtained multiplied by 0.566 yields the corresponding quantity of ammonium sulphate in the portion assayed. From this the quantity in the whole 500 C.c. is easily calculated. The difference between this and the total weight of the precipitate is "albuminose."

Example: Supposing 5 Gm. of a "peptone"—deprived of insoluble and coagulable albumen—had been dissolved to 500 C.c.; 100 C.c. of this (= 1 Gm. "peptone") had been precipitated, with ammonium sulphate, yielding 0.5225 Gm. of dry precipitate; this dissolved to 500 C.c., and in 100 C.c. of this the sulphuric acid assayed yielded 0.1290 Gm. $BaSO_4$. This multiplied by 0.566 yields 0.073 Gm. of ammonium sulphate in the 100 C.c. examined. Hence the 500 C.c. contained 0.3650 of ammonium sulphate. Hence the precipitate contained 0.5225 — 0.3650 = 0.1575 Gm. or 15.75 per cent of albuminose.

7. *II. Final Stage: Peptone.*—The solution prepared for No. 6 is used. In the case of stronger "peptones," 50 C.c. are sufficient; in weaker ones 100 C.c. may be taken. Acidulate it strongly with sulphuric acid, and add solution of phosphomolybdate of sodium [prepared, as usual, for analysis, and containing in every three volumes 1 vol. of dilute sulphuric acid (1 : 3)], until a precipitate is no longer produced. Collect this on a filter, wash it with dilute sulphuric acid (1 : 3), and determine in it, while still moist, the nitrogen by Kjeldahl's method. It should be stated here that phosphomolybdate of sodium precipitates both the albuminose and the peptone—that is, all the albuminoids in the liquid. By multiplying the quantity of nitrogen obtained by 6.25, the total albuminoids are found; and by deducting therefrom the albuminose found after § 6, the amount of peptone proper is determined.

Jumbul Seeds in Diabetes.—Dr. Graeser has published a paper on jumbul seeds, in which he develops the statement quoted recently in the *Chemist and Druggist*, that jumbul is an excellent remedy for reducing the amount of sugar in diabetes, but he states that the drug as it now appears in commerce has entirely lost its active properties, so that before it can be effectively used as a remedy some means of isolating and keeping the active principle must be found.—GERMAN CORRESPONDENT in *Chem. and Drugg.*